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## Alternative Proposals and Effective Protection of Computer Programs

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# ALTERNATIVE PROPOSALS AND EFFECTIVE PROTECTION OF COMPUTER PROGRAMS

DAEHWAN KOO†

## I.

### INTRODUCTION

The concern of this study mainly arises from the necessity of protecting software-related inventions effectively. It is set against the backdrop of the rapid development of e-commerce related technologies and the sharp increase in the number of resulting patent applications. In spite of many debates,<sup>1</sup> computer programs are now protected by patents in the European Patent Office (EPO), the United States of America (US), and Japan. Patents can also be obtained for software-implemented business methods in the US.

One of the main problems of the patent system in protecting computer programs in general, and business methods in particular, concerns regarding the economics of software innovation. There have been many disputes over the proper level of protection for software-related inventions. Proponents for software patenting argue that patent protection will encourage more innovation in the software industry. Opponents maintain that software patenting will stifle innovation, because the characteristics of software are basically different from those of the inventions of old industrial society, e.g. mechanics and civil engineering.<sup>2</sup>

According to the study on the fundamental question of whether or not protecting software by existing legal regimes (i.e. patent, copyright and trade secrecy) is optimum and desirable in light of innovation economics, the existing regimes have a number of disadvantages as well as advantages. The existing proprietary regimes do not provide appropriate protection for software innovation. They are not in harmony with the characteristics of software and its development as well as the vulnerability of software innovations. The development of the

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<sup>1</sup> In the US, software was generally considered excluded from patent protection until the late 1980's court decisions.

<sup>2</sup> Daehwan Koo, *Patent and Copyright Protection of Computer Programs*, INTELLECTUAL PROPERTY QUARTERLY, 2002, 2, 172-211.

Internet has significantly reduced the cost of copying and increased the risk that small-scale innovators will keep their know-how secret. The vulnerability of sub-patentable innovations to copiers generates fears of market failure. Patents can protect the idea or concept in computer programs, which may have great value. If developing software requires high investment and rapid innovation, patents appear to be a good incentive to innovate.<sup>3</sup> As the importance of doing business on the Internet grows, the need to protect the software by patents grows. The novelty and inventive step requirement of patent law, however, prevents software innovations, which are essentially incremental and cumulative, from patent protection. Moreover, by rewarding an inventor with strong exclusive property rights, the patent system impedes the process of follow-on innovation. Copyright protection for software is convenient because it is automatic. However, it does not protect program behavior, which can be an important feature of a computer program's success in the marketplace. Copyright does not protect the idea or concept in software. It protects only the specific form where the idea is expressed. Everyone can use the idea. Trade secrecy cannot protect behavior used in software products, since such know-how is largely evident in distributed products and trade secrecy cannot protect what is not secret. It is basically difficult to keep innovative industrial designs secret once embodied in distributed products.

These problems with the existing regimes lead us to investigate possible alternatives to protect computer programs appropriately. Thus, this study examines the basic structures and features of the alternative systems. Evaluation of the alternative systems through economic perspectives on the basis of the characteristics of modern software development vindicates the idea that the Direct Protection of Innovation proposed by Kingston and Kronz is the most appropriate form of protection for computer programs. This study also investigates main issues that should be considered in introducing the direct protection system to protect software.

There are four main purposes of this present study. First, it is to investigate alternative proposals for the protection of computer programs. Second, it is to find the most appropriate form of protection for software by evaluating alternative proposals in light of the characteristics of software, software market, and software development. Third, it is to define the subject matter of the alternative protection

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<sup>3</sup> In this respect, technological innovations should not be excluded from being patentable merely because the innovation exists in software.

systems. Fourth, it is to provide suggestions that should be considered in order to introduce the new regime at the international level.

This study will suggest a new approach to the issue of protecting computer programs based on the Direct Protection of Innovation proposed by Kingston and Kronz. Thus, the real novelty of this study would exist in the application of the Direct Protection of Innovation to the problems of software protection thrown up by existing regimes. Another novel aspect of this study can be found in the effort to define the subject matter of the alternative proposals and evaluate the alternatives in light of software development and the defined subject matter.

This study begins in Chapter II by investigating alternative proposals, which include A Market-Oriented Legal Regime, Compensatory Liability Regimes, Utility Models, Direct Protection of Innovation and Self-Help Systems. In this chapter, this study tries to define the subject matter that these alternative proposals are seeking to protect.

Chapter III evaluates the alternative proposals in light of the economic perspectives and the characteristics of modern software development, and it tries to find out the most appropriate form of protection for software at the present day. It should be considered whether the defined subject matter of each of the alternative proposals matches with modern software innovations. According to the evaluation revealed in this chapter, the Direct Protection of Innovation proposed by Kronz and Kingston is the most appropriate form of protection for software because it solves the most serious problems of the existing regimes and has many advantages such as familiarity and feasibility. With this conclusion, Chapter IV provides suggestions of how the Direct Protection of Innovation could be introduced at the international level.

## II.

### ALTERNATIVE PROPOSALS

Software patenting is becoming a global trend. This trend appears to be accelerating through the rapid growth of the Internet and e-commerce. If we consider the importance of the features involved in business methods carried out on the Internet, software patenting is essential. However, in light of the basic idea of the patent system, it is necessary to consider whether extending the scope of software patents will work properly, because overly broad protection will stifle competition and result in a cost to the public, while narrow protection will

discourage innovators.<sup>4</sup> If existing legal regimes (i.e. patent, copyright law, and trade secrecy) do not provide appropriate protection for software innovations, it is reasonable to consider providing new legal protection for these small innovations. The new regime should solve the critical issue of the relationship between the first comer and second comer in sequential innovation, i.e. encouraging innovation without impeding follow-on innovations. However, it is desirable that the new legal regime should be built on existing legal foundation. The new legal regime would be able to supplement or replace one of the existing regimes, e.g. the patent system, rather than replacing all of them by a new one.<sup>5</sup>

There have been suggested a number of alternative proposals which include (1) A market-oriented legal regime,<sup>6</sup> (2) Compensatory liability regimes,<sup>7</sup> (3) Utility Models, (4) Direct protection of innovation,<sup>8</sup> and (5) Self-help systems.<sup>9</sup> In order to find the most appropriate form of protection for software, it is necessary to evaluate these alternatives in light of the economics of software innovation and the development of software.

### A. A Market-Oriented Legal Regime

#### 1. Introduction

Considering the fact that the primary purpose of the intellectual property right (IPR) system is to encourage technological innovation and the transfer and dissemination of technology,<sup>10</sup> a new legal regime to provide appropriate protection for software should be a market-based (or market-oriented) one in which innovation and dissemina-

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<sup>4</sup> See e.g., Koo, *supra* note 2, at 195-197.

<sup>5</sup> This is because the existing regimes have many advantages as well as disadvantages, and because they have been so widely used that abolishing them might cause more difficult problems.

<sup>6</sup> See generally, Pamela Samuelson, Randall Davis, Mitchell D. Kapur, & J.H. Reichman, *A Manifesto Concerning The Legal Protection of Computer Programs*, 94 COLUM. L. REV. (1994) [hereinafter *A Manifesto*]

<sup>7</sup> Jerome H. Reichman, *Of Green Tulips and Legal Kudzu: Repackaging Rights in Sub-patentable Innovation*, in EXPANDING THE BOUNDARIES OF INTELLECTUAL PROPERTY: INNOVATION POLICY FOR THE KNOWLEDGE SOCIETY 23-53 (Rochelle Dreyfuss, Diane L Zimmerman and Harry First eds., Oxford University Press 2001) [hereinafter EXPANDING].

<sup>8</sup> DIRECT PROTECTION OF INNOVATION (William Kingston ed., Kluwer Academic Publishers 1987) [hereinafter, DIRECT PROTECTION].

<sup>9</sup> See, e.g., Kenneth W. Dam, *Self-Help in the Digital Jungle*, EXPANDING, *supra* note 7, at 103-122. (encryption, invisible messages, watermark and so on).

<sup>10</sup> Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization [hereinafter WTO Agreement], Annex 1C, [hereinafter TRIPS Agreement] Part 1, Article 7, available at [http://www.wto.org/english/tratop\\_e/t\\_agm0\\_e.htm](http://www.wto.org/english/tratop_e/t_agm0_e.htm) (last visited November 16, 2003).

tion of technology occur naturally. Under the regime, innovations should build on past innovations, and incentives for innovations today should not stifle future innovations.

The authors of *A Manifesto Concerning The Legal Protection of Computer Programs*,<sup>11</sup> have concluded that while copyright law can provide appropriate protection for some aspects of computer programs, other valuable aspects of programs (e.g. the useful behavior generated when programs are in operation and the industrial design to produce this behavior) are so vulnerable to rapid imitation that, if left unchecked, it would undermine incentives to invest in software development.<sup>12</sup> The authors of *A Manifesto* oppose efforts to expand the boundaries of existing legal regimes to protect these aspects of programs.<sup>13</sup> They suggest that a *sui generis* approach to legal protection of computer programs is required.<sup>14</sup> They explain why it is desirable to take a market-oriented approach to providing legal protection to these aspects of software.<sup>15</sup> A market-oriented legal regime, they explain, needs criteria to assess when market failure is likely to occur.<sup>16</sup> They suggest three principal factors to judge the possibility of market failure from rapid copying: (1) the nature and size of the software entity (or component) that has been imitated; (2) the second comer's access means to the innovation and the degree of dependence of the second comer's product; and (3) the degree of similarity between the first and second products.<sup>17</sup>

Market failure is likely if (1) the nature and size of the entity imitated is substantial, (2) the second comer's development is rapid, easy and highly dependent on the first comer's product, and (3) the degree of similarity approaches identity, and the second comer's market is proximate to that of the first comer's.<sup>18</sup>

To provide suitable protection for computer programs, which do not fit neatly within the traditional forms of intellectual property, the authors of *A Manifesto* suggest goals and principles for a market-oriented approach.

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<sup>11</sup> *A Manifesto*, *supra* note 6, at 2308.

<sup>12</sup> *Id.* at 2310.

<sup>13</sup> *Id.* at 2311.

<sup>14</sup> *Id.* at 2312.

<sup>15</sup> *Id.* at 2314.

<sup>16</sup> *Id.* at 2378.

<sup>17</sup> *Id.* at 2314-15, 2378.

<sup>18</sup> *Id.*

## 2. *Goals and Principles for a Market-Oriented Approach*

According to the authors of *A Manifesto*, there are goals and principles, which can be a basis of assessing the best option among possible legal mechanisms for protecting program know-how. Although any one legal regime cannot achieve all the goals and principles, it is important to achieve a balance between conflicting principles, and to satisfy as many principles as possible.

1. *Build on existing legal foundations.* Because, in some respects, existing legal regimes appropriately protect software innovations without distortion of their basic principles, a total revision may be unnecessary. Copyright law, for example, has provided a simple and effective means of deterring wholesale copying of source and object code, expressive texts, pictures, or audiovisual material. Any new legal regime should supplement protection of existing legal regimes.<sup>19</sup>
3. *Focus on the most serious problems.* Since no legal regime can solve all problems and solve them perfectly, the goal should be focused on a workable solution to the most serious problems in the software industry.<sup>20</sup>
4. *Provide reasonably predictable scope and duration.* A legal regime that protects program behavior and industrial design should be reasonably predictable as to scope and duration of protection. This will reduce the potential for litigation.<sup>21</sup>
5. *Be Responsive to the characteristics of software.* The regime should be responsive to the nature of software. The regime should provide protection of the true sources of value in software: behavior, the industrial designs that produce behavior, and conceptual metaphors.<sup>22</sup>
6. *Be technically coherent.* The regime should make legal distinctions that are technically coherent.<sup>23</sup>
7. *Evolve naturally.* The regime should be able to evolve naturally as the software technology evolves.<sup>24</sup>
8. *Encourage dissemination.* The regime should encourage disclosure and dissemination of program know-how, facilitating improvements and new applications.<sup>25</sup>
9. *Encourage innovation.* The regime should encourage useful innovation and discourage overheated innovation.<sup>26</sup>

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<sup>19</sup> *Id.* at 2406.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> *Id.* at 2407.

<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

10. *Avoid market failure.* The regime should avoid market failures.<sup>27</sup>
11. *Provide reasonable lead-time.* The regime should provide reasonable lead-time.<sup>28</sup>
12. *Be attuned to the development rate.* The regime should be attuned to the rate of development in the market. The rate depends on the state and pace of innovation in the market, and the relative maturity of the market.<sup>29</sup>
13. *Provide an opportunity to recoup investment.* The regime should provide an opportunity for innovators to recoup their R&D expenses as far as their work is valuable innovation.<sup>30</sup>
14. *Avoid duplications.* The regime should avoid wasteful duplicate effort.<sup>31</sup>
15. *Share costs.* Market participants should share R&D costs in a competition-enhancing way. A second comer may have a choice between contributing to the costs of the R&D and refraining from appropriating the innovation for a market-preserving period.<sup>32</sup>
16. *Provide remuneration.* A market-oriented legal regime should recognize the value of an innovation regardless of commercial success of the product embodying the innovation. Since many valuable and incremental innovations in software appeared in commercially unsuccessful products, the regime should find a way to encourage innovation, independently of whether or not it is a successful product.<sup>33</sup>
17. *Provide incentives to agree rather than to litigate.* A market-oriented legal regime should provide incentives to agree rather than to litigate. To avoid litigation costs as well as high transaction costs of licensing, it is desirable to provide standard licensing arrangements.<sup>34</sup>
18. *Distinguish among different kinds of second comers.* A market-oriented legal regime should consider a number of factors in determining whether second comers should pay a standard fee to use an innovation or should be blocked from use for a period of time. Such factors may include the relative size of the appropriated innovation, the manner by which the taker accessed it, the degree of similarity, the extent of improvement,

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<sup>27</sup> *Id.* at 2407-08.

<sup>28</sup> *A Manifesto, supra* note 6, at 2408.

<sup>29</sup> *Id.*

<sup>30</sup> *Id.* at 2409.

<sup>31</sup> *Id.*

<sup>32</sup> *Id.* at 2409-10.

<sup>33</sup> *Id.* at 2410.

<sup>34</sup> *Id.* at 2411.



and the proximity between the markets where the innovator and second comer are operating.<sup>35</sup>

19. *Be self-executing.* The more self-executing a legal regime is, the more “market-friendly” it will be. A market-oriented legal regime should minimize the costs of obtaining protection. One way to achieve both market protection and self-execution is to provide some degree of lead-time protection automatically. This is especially important in rapidly developing technology fields, such as software.<sup>36</sup> Software developers generally need legal protection most in the first few years after they have introduced an innovation to the market.<sup>37</sup>
20. *Minimize barriers to entry.* A market-oriented legal regime should minimize barriers to entry. Artificial barriers to entry, which were intended to cure market failure, may cause another kind of market failure.<sup>38</sup>
21. *Promote consumer welfare.* A market-oriented legal regime should promote consumer welfare. The regime should be cautious of both overprotection and underprotection.<sup>39</sup>

### 3. Frameworks for a Market-Oriented Legal Regime

A market-oriented legal regime should pursue the satisfaction of as many of the principles discussed above as possible.<sup>40</sup> An ideal legal regime may protect just long enough to enable the software innovator to enjoy the same lead-time as other innovators who contributed equal value to the market.<sup>41</sup> The required amount of artificial lead-time would depend on the amount of natural lead-time already available, in accordance with the difficulty of reverse engineering.<sup>42</sup> If such individualized tailoring were possible, each innovator could count on the chance of earning the return to justify its investment.<sup>43</sup>

#### a. Automatic Blockage of Cloning:

However, since such individualized tailoring would be unfeasible, a more plausible approach would be to protect program behavior and other industrial design elements of a program against cloning for a period of time sufficient to avoid market failure. Protection against

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<sup>35</sup> *Id.*

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> *Id.* at 2412.

<sup>39</sup> *Id.* at 2414.

<sup>40</sup> *Id.* at 2413.

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

cloning by law might commence from the first public marketing of the program embodying it.<sup>44</sup>

The advantages of this approach are the following: (1) It is low-cost and self-executing; (2) It would directly protect against the next most trivial means of acquiring functional equivalence after entire duplication of code, identical copying of program compilations and engineering designs; (3) Because it would be limited to protecting against identical or near-identical copying, it would be relatively predictable; and (4) After the duration of protection that would be consistent with lead-time, it would allow compiled know-how to be reused thereafter, promoting cumulative innovation, competitive add-ons, and the standardization of efficient solutions.

The disadvantages are the following: (1) It seems too weak, because substantially similar implementations would not be regarded as clones; (2) Without a registration system, it may be difficult for second comers to know when the anti-cloning period expires; and (3) It will not give any compensation to the innovator whose own commercialization effort is a failure, though whose innovation is exploited by others with success and benefits the market.

*b. Automatic Anti-Cloning Protection Followed by an Automatic Royalty-Bearing License:*

The disadvantages of automatic blockage of cloning protection lead us to consider a two-phase protection regime. The first phase would block clones in order to give innovators the opportunity to develop a market niche. The second phase (automatic license period)<sup>45</sup> would require users to pay standard licensing compensation to the innovator. By this second phase, regardless of the commercial success, the innovator can receive some compensation from others who use his innovation. The duration of the second period should be short under the principles discussed above.

However, without a registration system to identify and describe the subject matter to be protected, it would be difficult to know when blockage periods ended, when the automatic license period commenced, and what was protected. Transaction costs for licenses could be low, if the law implements a standardized licensing form.

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<sup>44</sup> Kronz's "Innovation Patent," in DIRECT PROTECTION, *supra* note 8, at 47 (this is similar to the direct protection of innovation by Kronz and Kingston. The object of innovation patent by Kronz is the invention actually reduced to practice, and commercialized. The subject matter of innovation warrant by Kingston is an investment, which turns an idea into concrete reality).

<sup>45</sup> See *infra* Part II.B., *Implications of a Compensatory Liability Regime*.

c. *Semiconductor Chip Protection Act*.<sup>46</sup>

Like, Automatic Anti-Cloning Protection with registration, semiconductor chip design requires skilled efforts to make incremental improvements in the selection and arrangement of functional elements. As with software, semiconductor chip designs typically bear much of the incremental technical innovation on the face of the product in the market. Chips are very costly to develop, but once developed, their designs are vulnerable to fast and inexpensive appropriations. Second comers can acquire functional equivalence to an innovative chip design by copying products in the market. Due to these characteristics, semiconductor chips, like computer programs, are difficult to fit into the framework of traditional intellectual property law.

SCPA provides automatic anti-cloning protection to semiconductor designs from the date of the first commercial distribution of a chip embodying them.<sup>47</sup> This protection lasts for two years unless a chip developer registers the design at the Copyright Office.<sup>48</sup> The SCPA registration process, like that of copyrights, involves only a light examination of the application before a registration certificate issues.<sup>49</sup> A timely registration will extend the duration of protection to ten years.<sup>50</sup> The SCPA certificate, like that of copyright registration, constitutes *prima facie* evidence that the holder has SCPA rights.<sup>51</sup> Under SCPA, others are free to use aspects of a chip compilation as long as they design their competing chips independently.<sup>52</sup>

SCPA's actual subject matter is "mask works," that is, the set of stencils or "masks" used in the manufacture of chip layers under the technology in common use when SCPA was devised.<sup>53</sup> A set of "mask works" for a particular semiconductor chip design must accompany the application for registration sent to the Copyright Office.<sup>54</sup> A registration system has worked reasonably well for SCPA because mask works are an intermediate work-product of the manufacturing process

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<sup>46</sup> Hereinafter SCPA.

<sup>47</sup> *Kronz's "Innovation Patent,"* in DIRECT PROTECTION, *supra* note 8, at 42 (Protecting from the date of the first commercial distribution appears to be similar to the concept of Kronz's Innovation Patent system. Protection for a mask work commences on either the date it is registered with the Copyright Office, or the date on which it is first "commercially exploited" anywhere in the world, whichever is first.); see 17 U.S.C. § 904(a) (2003).

<sup>48</sup> 17 U.S.C. § 908(a) (2003).

<sup>49</sup> 17 U.S.C. § 908(e) (2003).

<sup>50</sup> 17 U.S.C. §§ 904(b), 908(a) (2003).

<sup>51</sup> 17 U.S.C. § 908(a) (2003).

<sup>52</sup> 17 U.S.C. § 908(e) (2003).

<sup>53</sup> 17 U.S.C. § 902 (2003). See also *id.* at § 901(a)(2)(2003) (defining "mask work").

<sup>54</sup> 17 U.S.C. § 908(c) (2003); 37 C.F.R. §211.5 (1993). The choice of mask works as the subject matter for the SCPA protection regime has been criticized because, as chip technology evolves, masks are less frequently used, making SCPA potentially obsolete.

that can accompany the registration application. Registration of chip designs also remedies some defects of a pure anti-cloning approach. For instance, applications for registration must state the date on which commercial exploitation commenced. This helps copyists determine when legal protection ceases. Masks deposited at the Copyright Office also make it easy to know with certainty the exact design protected. Registration also makes it easier to record transfers of IPRs.<sup>55</sup>

However, registration of software innovations would not be easy to achieve because there is no intermediate design document uniformly prepared by software developers. Software developers would be reluctant to register a design document that disclosed all of the internal design elements of their programs, and other information that they can now protect as trade secrets because of the difficulties of gaining access to it by decompilation. So, SCPA's registration system would be unworkable as a model for software.<sup>56</sup>

*d. Modified SCPA Approach: Some Automatic Protection Complemented by Registration of Innovative Elements:*

This approach provides a period of automatic anti-cloning protection and an opportunity to register innovative software compilations or subcompilations in order to acquire a longer period of exclusivity or a period of compensation under a standard licensing arrangement. The subject matter of this might include a new user interface design, a macro language, and a new algorithm. The applicant need not register the product as a whole, as is required under SCPA. This approach may best match the design principles.

Registration should probably be required to take place within a year or two of the first commercial distribution of a product. The legal regime should employ a copyright-like registration process (rather than a patent-like examination procedure). It allows later opportunities to challenge the qualification of the registered material for protection. This would minimize the costs of gaining protection in the software industry where the pace of innovation is fast.

Registration might give an extended period of exclusivity or an automatic royalty-bearing license<sup>57</sup> available on standard terms after expiration of the unregistered protection right. The latter would remove the transaction costs of licensing. Reasonable fixed fees would encourage second comers to compensate the innovator rather than duplicating effort. They would also serve the innovator in licensing negotiations.

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<sup>55</sup> See 17 U.S.C. § 903(c)(2) (1998).

<sup>56</sup> *A Manifesto*, *supra* note 6, at 2415-2418 (Section 7.4).

<sup>57</sup> See Reichman, *EXPANDING*, *supra* note 7, at 39-52 (Reichman's Liability Regime).

*e. A Market Segment Approach:*

Although exclusive rights regimes do not generally connect the scope or term with the market proximity of a second comer's product,<sup>58</sup> a market-oriented regime for protection of industrial design in software might do so. A second comer's ability to enter the market might be regulated according to how close the second comer's market is to the innovator's market. Some regulation of adjacent markets may be necessary, because a second comer's exploitation of an innovation in an adjacent market would have some potential to undermine the innovator's ability to use the innovation in the adjacent market. However, if the second comer's market is very distant from the innovator's market, the second comer's use of the innovation in that market may not have market-destructive effects and should be regulated lightly. Derivative uses of an innovation in remote markets might be blocked for a shorter period of time, or might be subject to an automatic license rather than a lead-time blocking period.

*f. An Improvements-Oriented Approach:*

An improvements-oriented approach distinguishes those who made improvements to an innovative program compilation of another's product from those who imitated the compilation without improvements. An improver might come to the market sooner than a copier. Or, the improver might license for a standardized fee, while the copier would be blocked.

Consideration of improvements would be desirable if a substantial similarity standard (rather than a substantial identity standard) were selected as the standard by which to judge whether a second comer had unfairly interfered with the market opportunities of a software innovator. However, it is often difficult to know whether differences from the original are improvements or mere attempts to avoid liability. Although consumers favor an improved version, this choice made by consumers does not exactly distinguish between substantive improvements and price improvements.

#### *4. Alternative Courses of Action*

Policymakers have at least three options for legal protection for software innovations. One is doing nothing. The second option is making minimal changes (i.e. Anti-Cloning Protection) to address the urgent underprotection problem: the lack of protection against cloning

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<sup>58</sup> Trademark laws consider market segment. Goods bearing the name of a first comer's product are generally regarded as noninfringing of trademark rights if the second comer's product operates in a market remote from that of the first user.

program behavior and other industrial design elements of software. Because a market-oriented legal regime for a fast-moving technology like computer software should minimize administration, protection against cloning should start automatically from the first commercial distribution, and last long enough to give innovators sufficient lead-time to develop a market niche.

The third option is establishing a registration-based system that would supplement anti-cloning protection to ensure that innovators would receive contributions from those who wish to re-implement their innovations. Since anti-cloning legislation is only a partial solution, a broader solution would be necessary. It will include a registration system for innovative compilations of applied know-how embodied in software. This system would help establish a documented prior art that could be useful to the development of software engineering. This registration system might also provide incentives for innovators to disclose innovative algorithms and other internal design elements of software, because they can get compensation for the disclosed innovations.

It is desirable to devise a legal framework that is adaptable as the software technology and markets evolve, because the evolution of technology and markets may affect the legal situation and may open a number of opportunities for electronic markets.

##### 5. *Subject Matter of the Protection*

The authors of *A Manifesto* think that the most important properties of programs are (1) their behavior, i.e. the set of results brought about when program instructions are executed, (2) the industrial design responsible for producing behavior, and (3) the conceptual metaphors that give behavior coherence.<sup>59</sup>

The primary source of value in a program is its behavior, not its text. A really important characteristic of programs is the fact that they behave. Behavior is an essential part of programs. Program behavior consists of all the actions that a computer can perform by executing program instructions. The authors of *A Manifesto* have tried to provide a new legal regime for the protection of "the applied know-how found in the design of program behavior."<sup>60</sup>

Conceptual metaphors are valuable as organizing principles for program behavior, as well as for the virtual worlds and objects they create. An innovative conceptual metaphor is one of the most valuable types of software innovation. The authors of *A Manifesto* assert

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<sup>59</sup> *A Manifesto*, *supra* note 6, at 2314.

<sup>60</sup> *Id.* at 2316-2320.

that the legal regime that protects software should find a way to protect the effort that produces such valuable new tools as conceptual metaphors.<sup>61</sup>

Computer programs are inherently compilations of sub-components. Program construction requires “selection and arrangement of useful components.” Software engineering involves assembling components (e.g. data, data structures, and algorithms) to produce a desired behavior. Thus, programs are “compilations of behavioral components” because larger programs are built from smaller programs and programs behave. Writing programs is an industrial design process similar to the design of physical machines.<sup>62</sup>

In response to the problems with the existing legal regimes, the authors of *A Manifesto* propose a two-part solution: a protection scheme organized around the source of value in software, i.e. program behavior and the applied know-how that produces it; and a protection scheme based in principles of market economics and market preservation.<sup>63</sup>

According to their explanation about the characteristics of (and the source of value in) computer software, the subject matter that they have sought to protect by the market-oriented legal regime are the following:

1. Program behavior, that is, the set of results brought about when program instructions are executed.
2. The industrial design, which is responsible for producing behavior.
3. The conceptual metaphors that give behavior coherence and/or that organize principles for program behavior, virtual worlds, and objects.
4. Selection and arrangement of useful components.<sup>64</sup>
5. Compilations of behavioral components.
6. The applied know-how that produces program behavior.

## 6. *Debates on A Manifesto*

Derrick agrees that there are many problems with trying to fit computer software under current laws. He argues that computer software is “a different type of animal and it requires a different type of cage.”<sup>65</sup> After discussing the problems with current copyright and

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<sup>61</sup> *Id.* at 2324-2326.

<sup>62</sup> *Id.* at 2326-2330.

<sup>63</sup> *Id.* at 2332-2365.

<sup>64</sup> Modern software development has mainly been characterized by the trend of integration, bundling, componentization and reuse.

<sup>65</sup> Douglas C. Derrick, *It Doesn't Fit: The Dilemma of Computer Software and Patent/Copyright Law*, E LAW – MURDOCH UNIVERSITY ELECTRONIC JOURNAL OF LAW, Vol 3,

patent laws in protecting computer programs, he introduces the goals and principles as well as the proposed frameworks for the market-oriented legal regime of *A Manifesto* as a solution.

With regard to the failure in providing adequate implementation details, however, *A Manifesto* is criticized by Gordon and Goldstein.<sup>66</sup> Even though they are persuaded by *A Manifesto* and admit that the law should be amended to protect software behavior, they suggest that the authors of *A Manifesto* should provide not just a proposal in itself, but explain how these principles would work in concrete form.

Arguing that *A Manifesto* does not provide a detailed *sui generis* statute implementing its “market-oriented” solution, and that *A Manifesto* simply provides a long list of goals and principles, Mark Aaron Paley suggests *A Model Software*. *A Model Software* assumes that the true sources of software value are its algorithms. It differs from *A Manifesto* primarily by defining what is protectable. While *A Manifesto* complicates protection by dividing software into five entities, *A Model Software* instead uses a much broader definition of the term “algorithm” which may contain all five of the software behavior entities, and tries to protect them with a single scheme.<sup>67</sup>

Ginsburg, one of the opponents of a new legal regime, argues (1) that the computer industry is currently thriving, (2) that the copyright does, to some extent, protect “behavior” of computer programs, and (3) that the alternative proposals are unlikely to achieve domestic enactment or broad international agreement.<sup>68</sup> However, Ginsburg’s positions (1) and (2) may be criticized as follow: (1) ‘Thriving market’ theory cannot justify the argument that no *sui generis* regime is necessary, because tomorrow’s market could be much better if more appropriate regime could be provided today. (2) Copyright cannot protect the idea or process that is underlined in the sequence of behaviors of computer programs, since copyright protection cannot “extend to any idea, procedure, process, system, [or] method of opera-

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No 1 (May 1996) at [www.murdoch.edu.au/elaw/issues/v3n1/derrick.html](http://www.murdoch.edu.au/elaw/issues/v3n1/derrick.html) (last visited June 1, 2002).

<sup>66</sup> Wendy J. Gordon, *Assertive Modesty: An Economics of Intangibles*, 94 COLUM. L. REV. 2579 (Dec. 1994); Paul Goldstein, *Comments on A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2573 (1994).

<sup>67</sup> See generally Mark Aaron Paley, *A Model Software*, 12 SANTA CLARA COMPUTER & HIGH TECH. L.J. 301. The Five Entities are: Program code, program compilation, subcompilations, algorithms, and features.

<sup>68</sup> Jane C. Ginsburg, *Four Reasons and a Paradox: The Manifest Superiority of Copyright Over Sui Generis Protection of Computer Software*, 94 COLUM. L. REV. 2559-60 (1994) at [www.law.cornell.edu/commentary/intelpro/gns94txt.htm](http://www.law.cornell.edu/commentary/intelpro/gns94txt.htm) (last visited June 1, 2002).



tion. . .regardless of the form in which it is embodied. . .in such work."<sup>69</sup>

### B. *A Compensatory Liability Regime*<sup>70</sup>

Both patent and copyright protections for software innovations are unsatisfactory due to the special characteristics of software. While patents tend to over-protect small innovations in the software industry, copyright provides under-protection resulting in too little incentive to the first comer. To solve this problem, Jerome H. Reichman proposed a compensatory liability regime.

#### 1. *Mechanics of the Compensatory Liability Regime*

Reichman explains the compensatory liability regime by a hypothetical 'green tulip' problem. The proposed compensatory liability scheme obligates second comers to pay equitable compensation for borrowed improvements over a relatively short period of time.<sup>71</sup> First comer (Breeder A), who has developed a green tulip, is entitled to a specified period of artificial lead-time during which the use of the green tulip requires not authorization but compensation.<sup>72</sup> Breeder A's entitlement operates as a liability rule and not as an exclusive property right.<sup>73</sup> He does not have the right to deter second comer (Breeder B), from borrowing his innovation (the green tulip) and Breeder B need not seek Breeder A's permission to use the innovation in the green tulip as long as Breeder B is willing to pay.<sup>74</sup>

If Breeder B remains patient and waits until the period expires, he may use the innovation freely.<sup>75</sup> An impatient Breeder B who possesses sufficient technical know-how of his own can develop a green tulip variety without compensation to Breeder A.<sup>76</sup> Breeder C is treated like Breeder B.<sup>77</sup> Breeder C is also free to use Breeder B's improved variety (a red, white and green tulip) to his other follow-on products without seeking authorization.<sup>78</sup> Borrowing the red, white and green tulip will require compensation to both Breeder A and B (if it is during the liability period of Breeder A and B).<sup>79</sup> If Breeder B

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<sup>69</sup> 17 U.S.C. §102(b) (2003).

<sup>70</sup> Reichman, *EXPANDING*, *supra* note 7.

<sup>71</sup> *Id.* at 39.

<sup>72</sup> *Id.* at 40.

<sup>73</sup> *Id.*

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> *Id.*

<sup>78</sup> *Id.* at 40-41.

<sup>79</sup> *Id.* at 41.

and C do not borrow from Breeder A during the liability period, and accordingly they pay nothing to Breeder A, Breeder A will nonetheless have benefited from a period of artificial lead-time.<sup>80</sup>

## 2. *Implications of the Compensatory Liability Regime*

The compensatory liability regime takes the form of an automatic license without the power to exclude.<sup>81</sup> Despite the weakness of the right, a right-holder would not necessarily collect less income. An aggressive second comer's applications might yield far more income than the first comer would have obtained if he had denied the license or granted it exclusively to a more congenial licensee. The possibility of unexpected returns arises especially when several second comers become interested in multiple follow-on applications (that could produce a cumulative benefit in excess of what the first comer's own business plan might otherwise have yielded). On the contrary, when Breeder B and C accomplished their own innovations, Breeder A must contribute to the development costs of Breeder B and C by paying compensation to them.

Reichman asserts that society would be cumulatively better off under the regime, while Breeder A is not always worse off and Breeder B retains sufficient incentives to play the game. Once Breeder B opts to make contributions to Breeder A's costs, he places himself in a position to collect similar contributions from Breeder C and even from Breeder A, who will often want to exploit the second comer's follow-on innovation in order to keep up with the state of the art.

Thus, according to Reichman, the proposed compensatory liability regime eliminates the economically unjustifiable tendency of exclusive property rights to allocate ownership of follow-on applications either to the first comer (at the expense of others) or to second comers (at the expense of the initial innovator).<sup>82</sup> In this state, the first comers can take their business strategies knowing that second comers must pay compensation for follow-on applications of the small-scale innovation in which they plan to invest, knowing also that they themselves are entitled to borrow back any such follow-on applications in return for compensatory liability. At the same time, the second comer's legal ability to borrow freely the first comer's innovation is limited in practice by the need to consider the profitability of his con-

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<sup>80</sup> *Id.*

<sup>81</sup> See *infra* Part II.A.3.b., *Automatic Anti-Cloning Protection Followed by an Automatic Royalty-Bearing License*.

<sup>82</sup> Reichman, EXPANDING, *supra* note 7, at 51.

tribution to the first comer's costs. Within the specified time limits, this automatic license should empower all the players to move between the status of lenders and that of borrowers, unimpeded by artificial legal barriers.

The developments of the Internet and e-commerce have reduced the cost of copying, shrunk lead-time, and thereby increased the risk that small-scale innovators will keep their know-how secret. The enactment of a general-purpose innovation law on modified liability principles would lessen these risks, because it would offer innovators a way to reduce market failure. The liability regime would also provide some protection for commercially valuable, small-scale innovations, and thus it would be possible to restrict the dominant patent-copyright dichotomy to truly non-obvious inventions and original works of authorship. Reichman concludes that the modified liability rule would resolve the difficulties of property-based rules for small innovations by providing a designated period of artificial lead-time, during which firms are permitted to borrow another's sub-patentable innovations whenever they contribute to the costs of development.<sup>83</sup>

### 3. *Subject Matter of the Compensatory Liability Regime*

How to enable entrepreneurs to appropriate the fruits of their investments in cumulative and sequential innovation without impeding follow-on innovations and without creating barriers to entry<sup>84</sup> has become one of the most difficult issues that law and economics of IPRs need to address.<sup>85</sup> Instead of the breakthrough or pioneer inventions of the past, it is the routine engineers' (1) cumulative and sequential working out of shared or common technical trajectories that increasingly drives the post-modern economy.<sup>86</sup> The routine engineers produce technical know-how: i.e. (2) "a store of information about methods or processes of production, which confers commercial advantages on those who possess it." The production of today's cutting-edge technical know-how is vulnerable to free-riding duplicators. This vulnerability of "small grain-sized innovation" to copiers breeds fears of market failure.

By suggesting a compensatory liability regime, Reichman seeks to identify some of the historical difficulties in protecting (3) small grain-sized innovations that do not rise to the level of novel and non-obi-

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<sup>83</sup> *Id.* at.52.

<sup>84</sup> See *infra* Part II.A.2., *Goals and Principles for a Market-Oriented Approach*. A market-oriented legal regime should minimize barriers to entry.

<sup>85</sup> Reichman, EXPANDING, *supra* note 7, at.23.

<sup>86</sup> *Id.* at 26.

ous inventions or original and creative works of authorship.<sup>87</sup> Under the regime, within a designated period of artificial lead-time, firms are permitted to borrow one another's (4) sub-patentable innovations, only if they contribute to the costs of development.

Reichman tries to protect the objects of the following:

1. Cumulative and sequential working out of shared or common technical trajectories.
2. A store of information about methods or processes of production that confers some commercial advantages on those who possess it.
3. Small-scale innovations that do not rise to the level of novel and non-obvious inventions or original and creative works of authorship.
4. Sub-patentable innovations.

According to the above list, the subject matter of the compensatory liability regime can be defined as sub-patentable innovations that do not rise to the level of novel and non-obvious inventions or original and creative works of authorship, but can confer commercial advantages on those who possess them.

### C. Utility Models

#### 1. Introduction<sup>88</sup>

The European Commission has presented a proposal for a Directive approximating the legal arrangements for the protection of inventions by utility model. Though this Directive is aimed at harmonizing the main provisions of national law regulating the protection of inventions by utility model, this form of protection appears to be more suitable for software innovations which have a limited degree of inventiveness (a lower level of inventiveness than that required for a patent) and a relatively short life, since it is more flexible and less burdensome than the patent.<sup>89</sup> Utility models are therefore a more effective tool to SMEs than patents.

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<sup>87</sup> *Id.* at 23-24.

<sup>88</sup> Proposal for a European Parliament and Council Directive: approximating the legal arrangements for the protection of inventions by utility model, 1998 O.J. (C 36) 13 [hereinafter, Proposal for Utility Model], available at [http://europa.eu.int/comm/internal\\_market/en/indprop/model/utilen.pdf](http://europa.eu.int/comm/internal_market/en/indprop/model/utilen.pdf); Amended proposal for a Directive on the protection of inventions by utility model, Commission of the European Communities, 2000 O.J. (C 248E) [hereinafter, Amended Proposal] available at [http://europa.eu.int/comm/internal\\_market/en/indprop/model/utilityen.pdf](http://europa.eu.int/comm/internal_market/en/indprop/model/utilityen.pdf).

<sup>89</sup> Proposal for Utility Model, *supra* note 53.

## 2. *Mechanics of the Utility Model Regime*

“A utility model is a registered industrial property right which confers exclusive protection for a technical invention.”<sup>90</sup> It largely resembles a patent in that the invention must be ‘novel’, ‘inventive’ and capable of industrial application, though generally the level of inventiveness required is not as great as it is in the case of patents. The main features of the utility model compared with a patent are a lower level of inventiveness<sup>91</sup> than that required for a patent, the absence of a prior examination of the protection conditions, and a limited protection period of no more than ten years.

To distinguish inventions protected by the patent system, it is necessary to define an inventive activity, which constitutes subject matter of the utility model. According to the proposal, “utility model” means the registered right, which confers exclusive protection for technical inventions.

Under the utility model regime, an invention would be considered as involving an inventive step if it exhibits either particular effectiveness in terms of ease of application, or a practical (or industrial) advantage. It is required that an invention should not be derived in a very obvious way from the state of the art. Examples include the following: an invention making it possible to solve a technical problem; an invention relating to the effectiveness of the use of a product in that it increases the product’s usefulness by making it more effective and easier to use.

Since the utility model would be granted without prior examination of the basic conditions, i.e. novelty and inventiveness, it could be provided rapidly and cheaply, but the protection conferred is less secure. Due to this deficiency of prior examination, in order to reinforce legal certainty and the rights of third parties, it is required to have a search report in the event of either legal proceedings to enforce the rights conferred by the utility model, or extension of the protection after the initial six-year period.<sup>92</sup> The search report is to be drawn up at the request of either the applicant or third parties.

The suggested period of protection is a maximum of ten years, comprising an initial period of six years followed by two periods of two years, where appropriate. The utility model confers on its proprietor the exclusive right to prevent third parties without consent from making, using, offering for sale, selling, or importing for these pur-

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<sup>90</sup> *Id.* at 3.

<sup>91</sup> It is, however, very difficult to determine the difference between the levels of inventiveness required for a patent and that for a utility model.

<sup>92</sup> Amended Proposal, *supra* note 53.

poses the registered product (or the product obtained by the registered process). The same invention may form the subject matter, simultaneously or successively, of a patent and a utility model. In order to avoid this dual protection, a utility model (which has been granted) should be regarded to be ineffective when a patent relating to the same invention has been granted.

### 3. *Implications of the Utility Model Regime*

Quick and simple registration enables the applicant to be protected within a short period of time against copies and imitations, thereby consolidating the competitive position of business, in particular SMEs. Rapid registration gives temporary protection and may lead to rapid commercialization of the invention.<sup>93</sup> It is very useful in countries where a substantial examination is carried out before a patent is granted and where the procedure is fairly long.

In the case of legal proceedings or extension of the protection after the initial six-year period, the requirement of the search report forces the proprietor to avoid excessive claims for their rights, or to abandon their unnecessary rights. Through the search report, if the utility model were recognized as not having novelty or inventive step, the right is invalidated. Moreover, the right-holders themselves suppress their excessive desire to invoke the power of law, because they are afraid that their right might be invalidated, and because they do not want to pay any unnecessary fee for the search report.

The lower novelty and inventive step requirements of utility models provide flexible conditions for obtaining protection for small technological advances. These flexible conditions encourage companies, especially SMEs, to apply for utility model protection. Since utility models are granted without any preliminary examination to establish novelty and inventive step, they are cheaper to obtain than patents.

From the competitiveness point of view, due to its speed and simplicity, the utility model may help SMEs to improve their market position and to facilitate the commercial exploitation of technical inventions. Business people recognize that they can hold on to a competitive lead only if they can prevent their competitors from copying or imitating them for a certain period of time through effective protection measures such as the utility model. They want to show originality and to distinguish themselves from their competitors, so that customers develop a positive image of their technological capability. Firms must constantly improve their products if they are to keep or increase

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<sup>93</sup> Proposal for Utility Model, *supra* note 53, at 11-12.

market shares. SMEs, unlike large firms, must step up their inventive activities if they are to face up to the stiffer competition.<sup>94</sup>

Utility model protection is appropriate for small technological advances with a relatively short lifetime, which are likely to develop in future. In this respect, utility model can be useful to SMEs, which account for more than 99% of all European firms, 66% of all jobs and 65% of turnover in the European Community.<sup>95</sup> Z.A. Silberston suggests that the introduction of a wider adoption of petty patents (utility models) would be the most likely to occur in the foreseeable future.<sup>96</sup>

On the other hand, according to a study carried out by ESRC, *Intellectual Property and the Small and Medium Enterprise*,<sup>97</sup> SMEs “preferred informal protection methods which were perceived as cheaper, more familiar and, for the most part, successful.”<sup>98</sup> In contrast, they viewed formal legal rights, particularly those requiring registration, as “expensive, time-consuming, complex and of limited value.”<sup>99</sup> “Registered rights were less commonly reported than other legal methods of protection.”<sup>100</sup> The results of the study show that SMEs “tend to use formal rights only in very specific circumstances” e.g. where high commercial benefits are expected; where SMEs “believe formal rights are likely to offer better protection than informal methods;” and where SMEs “possess the necessary resources and the desire to acquire, maintain and enforce formal rights.”<sup>101</sup> Moreover, most SMEs “reported no intention to pursue legal action. . . even when success was anticipated.”<sup>102</sup> “The costs associated with taking legal action” (money, time, difficulty of establishing infringement and risk to the reputation of the business) “were felt to be prohibitive.”<sup>103</sup> Most SMEs wanted to “allocate resources to product and process innovation, rather than acquiring and enforcing formal IPRs.”<sup>104</sup> Thus, utility

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<sup>94</sup> *Id.* at 18.

<sup>95</sup> According to the study carried out by ESRC, *Intellectual Property and the Small and Medium Enterprise*, 96.7% of all businesses in the UK have turnovers of under £1million available at <http://info.sm.umist.ac.uk/esrcip/Projects/I5253004.htm> (last visited December 13, 2003).

<sup>96</sup> Z.A. Silberston, *supra* note 8, at 213.

<sup>97</sup> *Intellectual Property and the Small and Medium Enterprise: Based Upon the Final Report to the ESRC*, available at [http://info.sm.umist.ac.uk/esrcip/Projects/L5253004/final\\_report.htm](http://info.sm.umist.ac.uk/esrcip/Projects/L5253004/final_report.htm) (last visited October 8, 2001).

<sup>98</sup> See *id.* Formal protection practices involve “the creation of legal rights and sanctions for their infringement.” Informal practices “attempt to restrict the possibility of having to enforce intellectual property rights thorough legal means.”

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> *Id.*

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

model regimes, which require registration, may be less appropriate than informal methods to SMEs.

#### 4. *Subject Matter of the Utility Models*

According to the utility model laws of Japan, the subject matter of the protection in the utility model system can be defined as industrially applicable devices relating to the shape, construction or a combination of articles, which are the creation of technical ideas by which a natural law is utilized.<sup>105</sup> Devices falling into the category of methods, devices of constituents and devices of chemical substances, articles not having a certain shape, animal species, and plant species are excluded from the registration of utility model.<sup>106</sup>

Computer programs, which do not have a certain shape, appear to be excluded from the subject matter of utility model.<sup>107</sup> However, the abandonment of preliminary examination to establish novelty or inventiveness, which results in simplicity and low cost, is worth considering for the protection of small technological advances with a relatively short lifetime such as computer programs.

### D. *Direct Protection of Innovation*

#### 1. *Introduction*

All the early grants of monopolies in exchange for doing something new were grants of patents for innovation, not for invention.<sup>108</sup> In exchange for sole rights, the patentee introduced a manufacture, which was new to the country.

Patents granted today relate only to information, not to the information which is embodied. The means of instructing the public about the new has been replaced by a description on paper, the patent specification. Since any protection by a patent to innovation is now removed, how much protection an innovation receives depends upon the distance between the idea (of invention) and its realization.<sup>109</sup> If the idea is capable of only one unique embodiment, indirect protection is as good as direct protection. If it can be embodied in several ways, however, the link between invention and innovation becomes weak, and indirect protection of the innovation becomes worthless.

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<sup>105</sup> JAPAN UTILITY MODEL LAW, Law No. 123 of 1959 as amended by Law No. 220 of 1999, Ch. II, no. 3-1.

<sup>106</sup> JAPANESE PATENT OFFICE, Part 10: Utility Model: Chapter 2. *Basic Requirements for Utility Model Registration*, in *Examination Guidelines for Patent and Utility Model in JAPAN 301(2)(i)* (1993).

<sup>107</sup> *Id.*

<sup>108</sup> Kingston, *supra* note 8, at 2.

<sup>109</sup> *Id.* at 3.



In these ways, the patent system has become less effective in protecting innovation. Moreover, the inventive step requirement of the patent system made it difficult for incremental innovation to be protected. The inventive step requirement effectively removed much incremental innovation from the scope of patent protection. The characteristics of this type of innovation are that once it has been done, reconstructing it from elements of prior art is very easy. Since incremental innovation emerges naturally and logically from what has been done before, it is particularly vulnerable to the patent examiner's typical examination of inventive step. Thus, adoption of the inventive step criterion meant the abandonment of patent protection for many incremental innovations.

Hermann Kronz and William Kingston have tried to extend the exploitation of the principle of patenting by reviving the direct protection of innovation. According to them, direct protection of innovation has many advantages; it may give protection to incremental innovations; it offers different protection for investment of different risks;<sup>110</sup> it provides secure protection to SMEs;<sup>111</sup> it makes innovation more profitable; and it generates great increase in investment.<sup>112</sup> On this ground, they proposed 'innovation patent' and 'innovation warrant', respectively.

## 2. *Kronz's Innovation Patent*

In the Kronz system, a concept or technical teaching is not protected. A concept can be protected through every possible individual embodiment of the concept. While the patent system gives a reward for ideas, an innovation patent gives a reward for turning ideas into concrete realities, i.e. for innovative action. Kronz argues that since an innovation patent refers directly to the innovative object, it offers better protection of the risky investment and must be an improved means of promoting innovation. After finding many drawbacks in the existing patent system, Kronz became convinced that it is necessary to re-establish the original doctrine of patent protection.

### *a. Features of Innovation Patent:*

The following are the main features of the Kronz proposals:<sup>113</sup>

1. The object of protection is not an invention but an innovation, i.e. the invention actually reduced to practice, and commercialized.

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<sup>110</sup> *Id.* at 92.

<sup>111</sup> *Id.* at 99-100.

<sup>112</sup> *Id.* at 95.

<sup>113</sup> *Id.* at 36.

2. Anything, which can be embodied in marketable new things, can be protected, not just technology.
3. Processes can be protected not directly, but through the physical components involved in them.
4. Capacity to commercialize an innovation as well as technical capacity to realize it is a condition for receiving protection. If either is lacking, it can be provided with a "substitute innovator" through contractual arrangements.
5. Protection grants a monopoly to make, use and sell the innovation for a prescribed period, in the same form as in the classical patent system.
6. The territorial extent of protection can be a country, a region of a country, or a group of countries by agreement.
7. The protection period would vary from case to case. It depends on the innovating firm, the market and the project.
8. Protection does not apply to the diffusion phase, just as it does not apply to the invention phase.
9. The scope of protection is defined by claims.
10. Novelty is destroyed only by "public prior use", which is established by first commercial use. It would relate only to the availability of the actual commercial embodiment to the public. Novelty is not influenced by the accessibility to any concepts or technical teaching, as long as the embodiment of the concepts or technical teaching does not exist in a fully commercial context.
11. The system would either replace or supplement the classical patent system.
12. Grants are incontestable unless the application involves fraud.
13. There is no obligation to continue use after the first act of commercialization, but this can result in substantial loss of rights.

*b. The Subject Matter of Innovation Protection:*<sup>114</sup>

In the Kronz system, what can be protected is an artifact whose use is new within the jurisdiction in its commercial form. Originations of a concept, discovery, design, models or prototypes do not qualify for the protection. Innovation patent is granted only to the combination of a tangible object and the initial act of commercializing it. If an innovation patent is granted, the object of innovation should be in the stage ready for commercialization. The only question is whether or not the object has been brought into public use for the first time in the jurisdiction by the applicant.<sup>115</sup>

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<sup>114</sup> *Id.* at 37.

<sup>115</sup> Herman Kronz, *Response in Defense of the Innovation Patent Concept*, in *DIRECT PROTECTION*, *supra* note 8, at 262, 268.

Innovation patents protect entire articles, whether they contain many different “inventions” or other concepts. The entity to be protected is the article (product or process) as offered for sale or other commercial use. The principle of “unity of invention” in the classical patent system is replaced by the “unity of the goods”.

The Kronz system grants protection to many incremental innovations, which could not be protected by classical patent system due to their lacking an “inventive step”. Such cases might include *transposition, application, identification, formulation, selection, simplification, combination* and *aggregation*.

The protection by the Kronz system extends beyond the individual object that is actually sold in two ways: Firstly, copying it merely by substituting “technical equivalents” is banned. Simply changing components, material, scale, form, proportions or arrangements for embodying the innovation would be within the scope of an innovation patent. Secondly, the patentee is allowed to list variants of his innovation other than the one he has actually used in the market. The protection he will receive for these will not be as good as for the one he has actually adopted. Others will be allowed to make and market them if they pay a royalty.<sup>116</sup> Thus, the obligation to commercialize in the Kronz system forces an innovator to select out of all possible variants of his ideas to turn into concrete reality, the one which will best meet the market’s needs.<sup>117</sup>

On the other hand, the “initial commercial act” would be defined by statute. It might include sales promotion, showing at exhibitions, commissioning plant with a view to production, supply to distributors and offer to sell. Internal use, which takes place within a commercial firm, qualifies because this is considered to have consequences in the commercial world outside.<sup>118</sup> Using within a public research laboratory, however, would not qualify for protection.

Direct protection by the innovation patent is similar to copyright.<sup>119</sup> In copyright, protection is not given to any idea or concept for the work, which an author or an artist might have in mind. Copyright protects the work itself. There is nothing in the copyright system that can be compared with “the inventive step” or “novelty” criteria of the patent system.<sup>120</sup> The important thing is whether or not something concrete has been produced through original effort.

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<sup>116</sup> See *supra* Part II.B.

<sup>117</sup> Kingston, *supra* note 8, at 39.

<sup>118</sup> *Id.* at 40.

<sup>119</sup> *Id.* at 39.

<sup>120</sup> See *supra* Part II.C.4 (there is no preliminary examination to establish novelty and inventiveness in utility model system).

Since only tangible objects can receive innovation protection, a process as such, which is not a tangible object, cannot qualify. In the Kronz system, this results in protection of a process through its components. A listing of both the hardware and the software involved in a process results in a description of the process. In a process, the innovative act only takes place when the process works.<sup>121</sup>

A similar approach allows innovation protection to cover computer programs and methods of doing business.<sup>122</sup> According to this system, a description of a method of doing business may consist of both the hardware and the software involved in the method of doing business. According to Kronz's explanation, a process controlled by computer programs can be described as an aggregate of tangible objects, interacting together. In the case of a chemical process, the apparatus used would be described, as well as the substances that are used in the apparatus. The "settings", "readings" or "timings" of all the interacting components of the apparatus as well as their mode of interacting, and the inputs and outputs of the operation would be given in terms of energy and materials.<sup>123</sup>

*c. Filing and Novelty:*

When an applicant can supply the proof to the Office that an initial act of commercialization of the technical innovation object has taken place, he can apply for a provisional grant of protection.<sup>124</sup> This will be granted immediately if he can supply a declaration by a competent authority that the subject matter is indeed novel, in the sense of "not being already commercially available".<sup>125</sup>

The Office will then publish the specification so that any interested third party may oppose the provisional grant. Since grant is irrevocable, unless it has been obtained through fraud, third parties are expected to submit the necessary information. The innovation patent office carries out its own independent examination.

In the classical patent system, a single document on its own can defeat a claim to novelty. In the Kronz system, such a document carries no influence at all since protection is not being given for a technical teaching, but for embodiments of teaching. A document will carry influence in the examination to the extent that it provides evidence of prior reduction to practice of the concept or teaching together with its

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<sup>121</sup> Kronz, *supra* note 8, at 263.

<sup>122</sup> Kingston, *supra* note 8, at 40.

<sup>123</sup> *Id.* at 41.

<sup>124</sup> *Id.* at 47.

<sup>125</sup> WILLIAM KINGSTON, INNOVATION, CREATIVITY AND LAW, 168 (1990).

actual use in public.<sup>126</sup> “New” does not refer to the teaching, but to the “act”. This “act” (object, product or process) must be new within the jurisdiction. In the innovation patent system, “novelty” is based exclusively on “domestic public prior use” of a product or process available commercially.<sup>127</sup> The innovation patent is granted to the first innovator (doer) not to the first inventor (thinker).<sup>128</sup>

*d. Claims:*

To define the scopes of the grant, Kronz uses “copy” or “option” claims.<sup>129</sup> “Copy” claim covers the innovation object in its precise concrete details, successively itemizing its elements, features and components, in a similar manner to “Jepson-type” claim.<sup>130</sup> The protection defined by a “copy” claim extends to technical equivalents, as in classical patents. Option claims cover alternative variants of the actual innovation object which has been the subject of the “first commercial act”. The content of an option claim as such cannot be cited against the novelty of another innovation patent application. It becomes effective only after it has been embodied.

*e. Scope of Protection and Infringement:*<sup>131</sup>

The copy claim is single claim covering the innovation object. Option claims will have weaker legal force than the copy claim. Licenses, if requested, cannot be refused.

Since innovation protection is granted for the combination of the innovation object with its commercialization, any act of infringement of the protection must contain both of these elements. Mere manufacture of all the parts that would constitute an object, which belongs to innovation patent, does not constitute full infringement. And the act of simply selling the innovation object would not. These are acts of indirect infringement. Only when both types of infringement are combined, there can be an act of full infringement.

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<sup>126</sup> Kingston, *supra* note 8, at 48.

<sup>127</sup> Kronz, *supra* note 8, at 269 (Kronz admits that proving “prior public use” is more difficult than proving prior publication of the idea in the literature).

<sup>128</sup> *Id.* at 260.

<sup>129</sup> Kingston, DIRECT PROTECTION, *supra* note 8, at 49.

<sup>130</sup> See generally Jeffrey G. Sheldon, HOW TO WRITE A PATENT APPLICATION, Practising Law Institute, November 1996 (Jepson-type claims are used to claim inventions that consist of improvements over existing articles, processes, or compositions of matter. After the description of a preamble that broadly describes all the conventional or known elements of the combination claimed, a description of the novel and non-obvious elements that constitute the new and improved portion of the claimed combination follows).

<sup>131</sup> 35 U.S.C. §271(a) (2003) (the definition of infringement in the patent statute encompasses making, using, selling, offering to sell, or importing a patented process or product).

Kronz thinks that an innovation patent is weaker than a classical patent in that it has only a reduced scope of protection. It protects against copying, including copying by the use of "technical equivalents".<sup>132</sup> An innovation patent also protects "optional" concepts disclosed by the patentee before the grant of the patent. Option claims do not deter their subject matter to be used by third parties, since the claims have the obligation to grant a license. The main purpose of option claims is to deal with the problem of infringement in cases where the supposedly infringing embodiment of the object of innovation is not a "technical" equivalent, but a "conceptual" one. In the innovation patent, the question of infringement can only arise when the subject matter of the option claims is used without license. However, since granting a license is obligatory, there should be very little litigation.

Kronz regards his system as being capable of supplementing or replacing the classical patent system. He thinks replacement as bringing the patent system back to its original value. Kronz accepts that if the patent is actually exploited, the innovation protection is not necessary.

### 3. *Kingston's Innovation Warrant*

Like Kronz, Kingston as well has made the proposals for direct protection of innovation. Direct protection of innovation by warrants is achieved by making the subject matter an investment that turns an idea into concrete reality. Warrants protect the investment, which is concerned with getting new things done, where new information is generated. In fact, anything new can be protected, as long as it can be the subject of investment, which means anything that can be bought and sold.

#### *a. Subject Matter and Novelty Criterion:*

In the warrant system, the subject matter of warrant protection is not an idea, but investment to turn an idea into concrete reality. New goods or services can be protected by the system, as long as it can be the subject of investment. If the subject matter of the warrant application is not available for purchase now in the ordinary course of trade, an investment to make it available is entitled to the protection of a warrant.<sup>133</sup> Anything that can be bought and sold comes within the scope of the system, which extends far beyond technology. This means that computer software and methods of doing business can be pro-

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<sup>132</sup> Kronz, *DIRECT PROTECTION*, *supra* note 8, at 261.

<sup>133</sup> Kingston, *DIRECT PROTECTION*, *supra* note 8, at 63.

tected.<sup>134</sup> The criteria would be newness and the purchasability of the things for money. An important feature of Kingston's scheme is his emphasis on the national market. A product to be protected should be available in ordinary course of trade for the first time, and that means that it should be available through investment for production in the national market. (Imports would not satisfy the condition for the innovation warrant, while they would for Kronz.)<sup>135</sup>

Since the warrant system eliminates the argument of the "inventive step", it fits well with incremental innovations, such as computer software. For example, if a product with a particular new feature is not available in the ordinary course of trade and a product of a general type is available, an investment to bring the product with the new feature on the market is entitled to a warrant.

*b. Features:*

The main features of the warrant system are "public enforcement", incontestability and risk consideration. The innovation office renders the enforcement of the warrant. This makes the quality of the monopoly completely independent of the warrant holder. There is particular logic to this approach. Since a warrant is granted by the state in order to encourage innovative investment, an attempt to infringe a warrant is regarded not just an act that damages the rights of a warrant-holder, but also an attack on the economic policy of the state. The innovation office itself can prosecute infringers on behalf of the warrant-holder.<sup>136</sup> Kingston asserts that, considering the importance of a firm's investment that is at high risk in the generation of new information embodied in its product, the firm's asset arising from its efforts at innovation should be protected by the state, as in other types of property, e.g. money or buildings.

The warrant grant is incontestable unless obtained by fraud, as in the Kronz system. Therefore, once a grant is made after opposition proceedings investment can be based upon it with complete confidence. Incontestability combined with freedom from litigation would make a warrant attractive for investment opportunities.

The term for the monopoly is determined by the consideration of the risk undertaken in an innovatory investment.<sup>137</sup> The length of the monopoly period is considered to match the reward to the risk in an investment. Kingston thinks that the more perfect the protection is, the shorter warrant terms can be.

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<sup>134</sup> Silberston, *DIRECT PROTECTION*, *supra* note 8, at 203.

<sup>135</sup> *Id.* at 203-204.

<sup>136</sup> Kingston, *supra* note 8, at 66.

<sup>137</sup> *Id.* at 62.

c. *Procedure*:<sup>138</sup>

A firm that wants to acquire an innovation warrant submits a proposal for investment to bring something new on the market, to the innovation office. The innovation may be a new product, or a product already on the market, but with some new features. The application should specify the amount of investment estimated to be required to carry out the innovation.

The office carries out an initial screening process to eliminate applications, which are already on the market. There can be a right of appeal to the courts for the office's rejection. When the office's screening shows that the proposal is *prima facie* new to the market, its technical details are published, and a period is allowed for third party objections. Since a warrant is incontestable unless obtained by fraud, monitoring of such publication is very important to all firms.

After the opposition proceedings, if there is no ground for rejection, the office calculates both project-related and firm-related risks, and offers an option on a warrant for the appropriate term to the applicant.<sup>139</sup> When the innovation office offers a warrant to the applicant, some period of time (option period) is allowed for the applicant to make his detailed plan, arrange financing, and reach a final decision as to whether or not to make the necessary investment. The period may be related to the length of term of the offered warrant. It is expected that decisions as to radical advances and decisions involving more resources of a firm will take longer than incremental innovations.

The continuance of a warrant in force is conditional on making an investment to carry through the innovation, and this is time-bound. The investment should be completed within a certain portion of the term, if the warrant is not to be nullified.<sup>140</sup> Stricter conditions would be given to the investment in incremental innovation and relaxed ones for a radical innovation.

d. *Infringement*:

Kingston explains that "infringement" means "attempting to diminish the value of an innovation warrant, other than by innovation."<sup>141</sup> To ensure the effectiveness of warrant-holder's monopoly, Kingston suggests that it is necessary to develop a new doctrine of "commercial equivalence". This doctrine requires looking beyond the doctrine of technical equivalence that applies in the patent system.

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<sup>138</sup> *Id.* at 76.

<sup>139</sup> *Id.* at 77.

<sup>140</sup> *Id.* at 78.

<sup>141</sup> *Id.* at 74.



This is because there are many ways where a competitor might diminish a warrant-holder's possibility of recouping investment, other than by producing a product, which is technically equivalent.

To protect warrant-holders, the innovation office should take action against competitors producing "commercially equivalent" products.<sup>142</sup> A different innovation which itself obtained a warrant will not be attacked under this procedure. However, a new warrant-holder may have to pay a royalty to an earlier warrant-holder, if his innovation is based upon the earlier one.

#### 4. *Implications of Protecting Innovation Directly*<sup>143</sup>

The two proposals, the innovation patent by Kronz and the innovation warrant by Kingston, were developed independently of each other.<sup>144</sup> They, however, have the following common features:

1. The subject matter of protection should be innovation, not invention.
2. Any economic object, including technology, can be protected.
3. The criterion of novelty should be actual commercial availability.
4. The term of grant should be variable.
5. Grants should be incontestable unless obtained by fraud.
6. Terms of grant may differ between regions of a country.
7. Examination relies heavily on a third party.
8. The system can be administered by an independent authority.

Their main differences are the following:

1. The innovation patent requires that an innovation object should exist before protection is given. This means that the associated investment should be made first. The innovation warrant offers protection before investment is made. Actual investment is the condition of keeping the monopoly in force.
2. The innovation patent system tries to match the length of monopoly to the individual innovative capacity of the patentee. However, the innovations warrant system seeks to eliminate official discretion and makes a set of terms, which may not correspond to the innovative capacity (exactly) in each case.
3. The innovation patent office prescribes licensing terms that consider the innovative capacity of the licensee. The innovation warrants have no similar provisions.
4. While the patentee of an innovation patent should protect his own right, in the warrant system the state should protect the warrants it makes.

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<sup>142</sup> Silberston, *supra* note 8, at 205.

<sup>143</sup> Kingston, *supra* note 8, at 87.

<sup>144</sup> Kingston argues that they were developed completely independently of each other.

5. The scope of protection is determined by “technical equivalents” in the Kronz system, and “commercial equivalents” in the Kingston system, respectively. The doctrine of “commercial equivalence” extends beyond “technical equivalence”.

*a. Incremental Innovation:*

Incremental innovation is most likely to be achieved in the small firm.<sup>145</sup> Incremental innovations are mostly the improvements to products or processes, which are individually small, but cumulatively of supreme economic importance.<sup>146</sup> They may be obvious to one skilled in the art, and therefore unpatentable under the present patent system.

Kingston asserts that direct protection for many incremental innovations can be achieved by the two proposals. The classical patent requires that an invention should have an inventive step and it should not be obvious to one skilled in the art. It is indeed true that the majority of patents are for small “improvements”.<sup>147</sup> The countless small changes in a product are those, which are underlying in the preceding technology, and grow naturally out of it. This “natural” or “evolutionary” growth makes them obvious and unpatentable. This means that the patent system does not protect investment in incremental innovation. By giving up the “inventive step” criterion, Kingston maintains, incremental innovations can be effectively protected. Kronz as well argues that the abandonment of the inventive step criterion is substantially what the innovation patent system proposes.<sup>148</sup> Considering the fact that “modifications” of something which already exist can obtain an innovation patent if it is neither a “technical equivalent” nor an object of an option claim of the initial innovation patent, innovation patents will be much the same as *utility model* in number and level.<sup>149</sup>

In the case of a second innovator who has brought an incremental change to a protected product, protection will be granted to the second innovator for the incremental change, but the grant will be endorsed with the requirement that the innovation cannot be put into practical effect without infringing the first innovator’s right, since it will use some of the information generated by the first innovation.<sup>150</sup>

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<sup>145</sup> Kingston, DIRECT PROTECTION, *supra* note 8, at 107.

<sup>146</sup> WILLIAM KINGSTON, THE POLITICAL ECONOMY OF INNOVATION, at 211.

<sup>147</sup> Kingston, *supra* note 125, at 173.

<sup>148</sup> Kronz, *supra* note 8, at 267.

<sup>149</sup> Kronz, DIRECT PROTECTION, *supra* note 8, at 270, 271. (The lower novelty and inventive step requirement of utility models provide protection for small technological advances).

<sup>150</sup> Kingston, DIRECT PROTECTION, *supra* note 8, at 313.

The use of the incremental improvement will depend on agreement between the two parties. The first innovator will naturally want the incremental improvement to be incorporated in his product as soon as possible. Agreements can be reached to allow the first innovator to collaborate with the second innovator, which would allow both innovators to benefit. One option could take the form of a royalty or another arrangement. The second innovator may have another choice. He can wait until the first innovator's monopoly is expired.<sup>151</sup> Then he will be free to use the first innovation with his own improvement incorporated in it.

*b. Know-How:*

Direct protection may also stimulate technology transfer by providing protection of know-how.<sup>152</sup> The existing patent system is supposed to do this, but in reality fails to do so. For example, studies of license agreements show that an important thing is know-how, not what is disclosed in the patent specification. A reason why "know-how" is lacking in the patent specification is that the inventive step criterion does not permit the protection of a craftsman's practical knowledge.<sup>153</sup> If know-how receives no protection under the present patent system, no applicant will want to disclose it. However, because both the innovation patent and warrant give protection to know-how, there is no reason why applicants would be unwilling to make these disclosures in exchange for protection.

*c. Infringement and Litigation:*

To determine whether or not an object belongs to the scope of the protection of an innovation patent or an innovation warrant, it is necessary to decide whether the object is a "technical equivalence" or a "commercial equivalence". The scope of "commercial equivalence" is much wider than that of "technical equivalence" and very difficult to determine. It includes the consideration of the time and the market, which the product belongs to. Even though an object is not a technical equivalent, it can be a commercial equivalent. In this respect, there could be many disputes. Moreover, "commercial equivalence" may change depending on time. As time goes by, an object, which constituted infringement before, may no longer be a "commercial equivalent", as the market changes.

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<sup>151</sup> *Id.* at 313; *see also supra* Part II.B.

<sup>152</sup> Kingston, *supra* note 125, at 175.

<sup>153</sup> Kronz, *supra* note 8, at 267.

Claims in innovation patent are unlikely to cause litigation.<sup>154</sup> Infringement of a copy claim will be a very unusual event, because such a claim covers the actual embodiment marketed by the patentee, with protection extending to technical equivalents only. A competitor can follow by “innovating around” a copy claim by changing the product in the ways that are not technically equivalent. Alternatively, a competitor can seek a license under one of the option claims. The option claims cover alternatives, which have been considered and tested by the innovator. A license to use the alternatives covered by option claims must be granted, if requested. In this respect, the two proposals are similar to the Liability Regime proposed by Reichman. Thus, infringement may be regarded as an unimportant feature for the innovation patent regime. On the contrary, infringement is very important for the innovation warrant.

Moreover, the innovations warrant proposals lift the burden of enforcing the monopoly grant from the warrant-holders. The typical problem of litigation is that it takes too much economic resources. If the warrant-holder cannot enforce without going to courts, and if he has no resources to do this, the protection is actually worthless. This is why the warrant proposals make the enforcement the responsibility of the granting authority. By contrast, in the innovation patent, enforcement remains the patentee’s own responsibility and infringement will be pursued through the courts in the same way as in the case of classical patents.

*d. Comments on Subject Matter of the Direct Protection:*

It is much better to give protection to an existing object or process that is new, than to the idea which can often be embodied in various ways. This is because ideas can be embodied in diverse economic objects, and they can be easily litigated.<sup>155</sup>

To give protection beyond technological products or processes may include the field of fashion, designs, organizations, sales methods, services (computer programs, information systems, management practices, etc) and the like. Thus, the innovation protection covers computer programs and methods of doing business.

Considering the importance of incremental innovations, especially in the fields of computer software, abandonment of the non-obviousness criterion in the innovation protection may be helpful for the protection of innovations of computer software.<sup>156</sup>

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<sup>154</sup> Kingston, *supra* note 8, at 325.

<sup>155</sup> Henk Wouter de Jong, *supra* note 8, at 225.

<sup>156</sup> In the innovation patent system the criterion of inventive step is no longer applied.

### E. Self-Help Systems:

“Self-help” refers to an expanding set of technologies and systems designed to protect content from unauthorized copying and to facilitate e-commerce involving content.<sup>157</sup> The author of *Self-help in the Digital Jungle* uses “content” broadly to include “text, data, images, audio, video, and all of the other media that patrons of the Web are familiar with.”<sup>158</sup> He uses the concept of a “content” in the broadest possible sense to include all forms of information and without distinction as to whether or not the information is legally protected against access by unintended recipients through intellectual property rights.<sup>159</sup>

Dam asserts that self-help systems will not only reduce the incidence of copyright violations, but will also be one of the crucial success factors in e-commerce. He maintains that because the systems can protect uncopyrightable or uncopyrighted materials as well as copyrighted materials, they should not be viewed as conflicting with the intellectual property law of copyright.

Self-help systems enable a content provider to transmit content to a potential reader by posting it on a website, e-mailing it, etc. while preventing anyone from accessing it without permission. The systems can facilitate implementation of many of the ideas underlying pro-competitive and fair use ideas embedded in intellectual property law.<sup>160</sup> Self-help systems can harness the characteristics of digital copies that are normally identical with one another. The technology of self-help systems lowers transactions costs and thereby reduces undesirable social behavior (such as free riding appropriation of content created by others). As transaction costs go down (and convenience goes up), it is easier for people to do the right thing (that is, paying or obtaining permission).

According to the research sponsored by the UK Economic and Social Research Council, under the £1.2 million program *Intellectual Property Initiative*, SMEs relied generally on copyright for their software.<sup>161</sup> 100% of the firms interviewed resorted to copyrights as

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<sup>157</sup> Kenneth W. Dam, *Self-Help in the Digital Jungle*, in EXPANDING, *supra* note 7, at 103, 104.

<sup>158</sup> *Id.*

<sup>159</sup> *Id.* at 107.

<sup>160</sup> *Id.* at 110.

<sup>161</sup> Dr. Puay Tang, John Adams, & Dr. Daniel Paré, *Patent Protection of Computer Programmes: Final Report*, Submitted to European Commission, Directorate-General Enterprise (2001) p.18 (their general reliance on copyright appears to be based on the characteristic of copyright, i.e. automatic protection unnecessary for formal registration) available at <http://swpat.ffii.org/papers/tangadpa00/tangadpa00.pdf> (last visited October 16, 2001) [hereinafter *Adams & Tang*].

their main mode of protection because it is cheap and automatic. They also employed several informal methods of protection, particularly technical systems, such as encryption,<sup>162</sup> dongles,<sup>163</sup> steganographic techniques,<sup>164</sup> key diskettes,<sup>165</sup> firewalls<sup>166</sup> and passwords.<sup>167</sup> More than half of the respondents used these systems. The research shows that, while only a minority of SMEs patent their software creation, the majority of them regard copyright, technical systems of protection, and licensing as the most common methods of protection.<sup>168</sup> The survey data on how SMEs rank the importance of methods of intellectual property protection reveals that 27% of SMEs ranked licensing as the most important means of protection; 24% of them regarded technical systems of protections as the most important; and 21%, copyright. It is interesting to note that 52% of those interviewed considered market niche and technical systems of protection as important methods of protection.<sup>169</sup>

Contrary to the wide use of technical methods (self-help systems against circumvention), several respondents, even though they were using the technical methods, acknowledged that such systems are gen-

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<sup>162</sup> Definition available at <http://searchsecurity.techtarget.com/glossary/0,294242,sid14,00.html> (last visited October 16, 2001). Encryption is the conversion of data into a form, called a ciphertext, that cannot be easily understood by unauthorized people. Decryption is the process of converting encrypted data back into its original form, so it can be understood.

<sup>163</sup> Definition available at <http://www.computerlanguage.com/sitemain/content.html> (last visited October 16, 2001). Dongle is the same as hardware key. Hardware key: Also called a "dongle," it is a copy protection device supplied with software that plugs into a port (parallel, serial, USB, etc.) on a PC. The software sends a code to that port, and the key responds by reading out its serial number, which verifies its presence to the program. The key hinders software duplication, because each copy of the program is tied to a unique number, which is difficult to obtain, and the key has to be programmed with that number.

<sup>164</sup> Steganography: Hiding a message within an image, audio or video file. Used as an alternate to encryption, it takes advantage of unused bits within the file structure or bits that are mostly undetectable if altered. A steganographic message rides secretly to its destination, unlike encrypted messages, which although undecipherable without the decryption key, can be identified as encrypted. For a white paper on the subject written by Neil F. Johnson of George Mason University, visit [www.jjtc.com/Steganography](http://www.jjtc.com/Steganography).

<sup>165</sup> Definition available at <http://www.computerlanguage.com/sitemain/content.html> (last visited October 16, 2001). Key: In cryptography, a numeric code that is combined in some manner with the text to encrypt it for security purposes.

<sup>166</sup> Firewall: A method for keeping a network secure from intruders. It can be a single router that filters out unwanted packets or may comprise a combination of routers and servers each performing some type of firewall processing. Firewalls are widely used to give users secure access to the Internet as well as to separate a company's public Web server from its internal network. Firewalls are also used to keep internal network segments secure; for example, the accounting network might be vulnerable to snooping from within the enterprise.

<sup>167</sup> Adams and Tang, *supra* note 117, at vi-vii, 19.

<sup>168</sup> *Id.* at viii, 58.

<sup>169</sup> *Id.* at 19.

erally very user unfriendly, and very complicated. Those who did not employ these methods explained the reason that the lack of an industry standard made them cautious about employing them.<sup>170</sup> Other respondents regarded the push for technical protection as a conspiracy by large companies to protect their territories from more innovative and imaginative smaller companies. Similarly, the Legal Advisory Board (of the European Commission) stated that the widespread use of technical protection devices might result in the *de facto* creation of new information monopolies. These views appear to emphasize the necessity to protect fair use rights.

### 1. *Types of self-help systems*

#### a. *Encryption:*

Encryption is the basic technology of self-help systems. The encrypted content is placed within a digital envelope so that the content provider can indicate in unencrypted text on the envelope what a reader has to do decrypt the content.<sup>171</sup>

#### b. *Digital Watermarks:*

A digital watermark<sup>172</sup> can be placed on an image so that any copies can be identified as being originated from the content provider or as being copied from an image transmitted to a specified party.<sup>173</sup> This discourages sending the copy on to a third party that might make copies unauthorized by the content provider. Digital watermark technology can be combined with a search program that wanders the net and looks for the provider's watermark, discovering unauthorized use of the content.

Contrary to the common misunderstandings about self-help systems, watermarks are not just for content providers, but they can enhance a user's capabilities. For example, a user of a program can determine the source of a watermarked photo and he can communicate directly with the original photo owner.

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<sup>170</sup> *Id.*

<sup>171</sup> Dam, *supra* note 157, at 107-08.

<sup>172</sup> Definition available at [http://lookup.computerlanguage.com/host\\_app/search](http://lookup.computerlanguage.com/host_app/search) (last visited October 16, 2001) (digital watermark: A pattern of bits embedded into a file used to identify the source of illegal copies. For example, if a digital watermark is placed into a master copy of an audio CD or a DVD movie, then all copies of that disc are uniquely identified. If a licensee were to manufacture and distribute them in areas outside of its authorized territory, the watermark provides a trace).

<sup>173</sup> Kenneth W. Dam, *supra* note 157, at 108.

c. *Invisible Messages:*

Self-help systems can attach invisible messages to content, which make it impossible to copy the content, or allow only a single copy, or send a message back to the content provider indicating how many copies are being made. Locking mechanisms can be classified as a kind of invisible messages. Content can be locked so that it has to be unlocked by each recipient. If the content provider transmits content to an original recipient who unlocks it by payment and then forwards it to a friend, the friend will receive a locked copy and cannot unlock it without paying.

The foregoing are just a few variations on the concept of a self-help system. Almost any conceivable combination or variations of the ideas discussed above are possible.

## 2. *Vulnerability of Self-Help Systems*

Self-help systems are vulnerable to attack, like any electronic on-line system. Computer programs can be written to detect and strip off invisible messages. It is anticipated that the development of software technologies will make it possible to detect digital watermarks and to wash them out.

## 3. *Fair Use and Self-Help*

The Digital Millennium Copyright Act enacted in October 1998 takes the first step in addressing the relationship between fair use and self-help systems. It applies only to copyright and leaves open the question of noncopyrightable content. Recognizing the vulnerability of self-help systems, the Act prohibits circumvention of any 'technological measure that effectively controls access to a copyrighted work as well as the manufacture, importation, or offer to the public of any technology primarily produced for the purpose of such circumvention.<sup>174</sup> But since such measures against circumvention may affect the exercise of fair use rights, the statute establishes a system for determining whether users of particular classes of works are adversely affected due to such prohibition in their ability to make noninfringing uses of that particular class of works.<sup>175</sup> Users of such classes of works are not subject to the circumvention prohibition.<sup>176</sup> Six categories i.e. criticism, comment, news reporting, teaching, scholarship and research are the kinds of potential fair use.<sup>177</sup>

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<sup>174</sup> 17 U.S.C. §1201(a)(1)(A) (2003); *see also* Dam, *supra* note 157, at 112.

<sup>175</sup> 17 U.S.C. §1201(a)(1)(B) (2003).

<sup>176</sup> *See id.*

<sup>177</sup> 17 U.S.C. §107 (2003); *see also* Dam, *supra* note 157, at 112.



#### 4. *Moral Rights and Deterrence*

Self-help systems can also serve the purposes of moral rights. Firstly, they can assure attribution to the author, artist, or composer. Secondly, they can ensure the integrity of documents, images and music.

Self-help systems also help protect against liability. Problems involving alteration of evidence in litigation can be avoided by time stamps to documents through invisible messages that can only be removed by a determined attacker.

Self-help systems can also protect artists who do not use self-help systems. Pirates, if they know that watermarks are being used to trace piracy, would choose those artistic works without a watermark and avoid those with a watermark. However, since watermarks are invisible, piracy of all artistic works will be deterred, not just those with a watermark.

#### 5. *Self-Help and Social Norms*

Technology can promote ethics and the public good by reducing transactions costs. The technology of self-help systems lowers transactions costs especially when combined with digital cash through increasing the convenience of payment. This reduces undesirable social behavior such as free riding appropriation of content created by others. As costs go down, it is easier for people to do 'what is right' (that is, paying or obtaining permission for copying content created by others). As more people do this others are more likely to follow suit and thus establish a custom of what is expected and acceptable behavior.

#### 6. *Subject Matter of the Self-Help Systems*

"Self-help" refers to technologies and systems designed to protect content from unauthorized copying.<sup>178</sup> Dam uses "content" to include "*text, data, images, audio, video, and all of the other media that patrons of the Web are familiar with.*"<sup>179</sup> He also uses the concept of "content" in the broadest sense to include "all forms of information and without distinction as to whether or not the information is legally protected against access by unintended recipients through intellectual property rights."<sup>180</sup>

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<sup>178</sup> Dam, *supra* note 157, at 103.

<sup>179</sup> *Id.*

<sup>180</sup> *Id.* at 107.

## III.

## EVALUATION OF ALTERNATIVE PROPOSALS

The problems with traditional protection for software have led us to investigate alternative proposals: (1) A market-oriented legal regime, (2) Compensatory liability regimes, (3) Utility models, (4) Direct protection of innovation, and (5) Self-help systems. In order to find the most appropriate form of protection for software, it is necessary to evaluate these alternatives in light of the software innovation and the development of software. It is also useful to consider the design principles and goals discussed in the market-oriented regime (e.g. to build on existing legal foundations, to focus on the most serious problems, to be responsive to the characteristics of software, to encourage innovation and so on).<sup>181</sup> The most appropriate protection would not only solve the most critical problems (i.e. discouraging follow-on innovations or causing market failure in the existing legal regimes), but also reflect the characteristics of the development of software and satisfy as many principles as possible.

*A. A Market-Oriented Legal Regime*

A market-oriented legal regime describes a number of design principles and goals, which can be a basis of a new form of legal protection for software.<sup>182</sup> The market-oriented regime provides a two-part solution: a protection scheme organized around the source of value in the software, i.e. program behavior, and a protection scheme based on principles of market economics. There are a number of possible legal mechanisms for implementing a market-oriented approach. The authors of *A Manifesto* think that the approach that appears to match best with the design principles is one that would provide software developers with both a market-preserving period of protection against cloning and a period of time within which to register their program design innovations. Registration would provide compensation for the use of the innovation by a second comer for a period of time after the expiration of the anti-cloning blocking period.

The market-oriented regime of which subject matter is the 'selection and arrangement of useful components', and 'compilations of behavioral components', well addresses the characteristics of modern software development, i.e. componentization and reuse. Automatic Anti-Cloning Protection Followed by an Automatic Royalty-Bearing License system (Anti-Cloning and Automatic License system) in the market-oriented regime provides the innovator with some compensa-

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<sup>181</sup> See *supra* Part II.A.2.

<sup>182</sup> See generally *A Manifesto*, *supra* note 6.

tion from others who use his innovation in the second phase, i.e. the automatic license period, regardless of commercial success. The Anti-Cloning and Automatic License system appears to be convenient and appropriate for the protection of software innovations in that the speed of software innovation is fast and the lifecycle of software products is short. However, it is difficult to determine the appropriate period of automatic anti-cloning protection, as well as the period of and license fee in the automatic royalty-bearing license. It must be proportionate to the lead-time necessary to give individual innovators the opportunity to develop a market niche. Moreover, because there is no registration system, it is difficult to identify what the subject matter to be protected is, and when the automatic license period commences.

Automatic Protection Complemented by Registration of Innovative Elements system (Automatic Protection and Registration system) requires registration that would give an extended period of exclusivity or an automatic royalty-bearing license.<sup>183</sup> Registration might be available on standard terms after expiration of the unregistered protection right. The registration system would help establishing a documented prior art. The automatic royalty-bearing license would remove the transaction costs of licensing. However, the Automatic Protection and Registration system has problems in that SMEs do not favor any formal registration system because they view formal legal rights, particularly those requiring registration, as expensive, time-consuming, complex and of limited value.<sup>184</sup>

The market-oriented regime falls short in identifying the concrete method to protect the conceptual metaphors to organize behavior and bring about a synthetic reality, i.e. virtuality, even though the authors of *A Manifesto* regard them valuable. The main problem with the regime is that instead of providing a detailed implementation scheme, it has only a basic framework for constructing a new form of legal protection for software innovations.<sup>185</sup>

### B. Compensatory Liability Regime

Reichman's compensatory liability regime correctly addresses the critical nature of software innovations, i.e. cumulative and incremental improvements based on componentization and reuse.<sup>186</sup> This is because the liability regime tries to protect cumulative and sequential working out of common technical trajectories as well as sub-patenta-

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<sup>183</sup> Automatic royalty-bearing license is similar to Reichman's Liability Regime.

<sup>184</sup> See generally available at [http://info.sm.umist.ac.uk/esrcip/Projects/L5253004/final\\_report.htm](http://info.sm.umist.ac.uk/esrcip/Projects/L5253004/final_report.htm) (last visited October 8, 2001).

<sup>185</sup> *A Manifesto*, *supra* note 6, at 2310-2316.

<sup>186</sup> Reichman, *EXPANDING*, *supra* note 7, at 29.

ble (or small-scale) innovations that do not rise to the level of novelty and non-obviousness to be patentable inventions.

Within a designated period of artificial lead-time firms are allowed to borrow one another's sub-patentable innovations only when they contribute to the costs of development. Second comers do not have to negotiate permissions. This reduces the transaction costs. The automatic license in the compensatory liability regime may minimize the unjustifiable tendency of exclusive property rights to allocate ownership of follow-on applications either to the first comer or to second comers.<sup>187</sup> This approach would provide sub-patentable innovators with enough lead-time to recoup their investments and make sufficient profits to enable further investments.<sup>188</sup> Thus, this regime solves the problem of appropriability in order to encourage investment without necessarily entitling the first comer to all the returns from follow-on innovation.<sup>189</sup> At the same time, this alternative would neither retard scientific research, nor hinder follow-on innovations, nor create legal barriers to entry. A properly crafted liability rule would offer those who innovate a way to alleviate market failure.<sup>190</sup>

However, one of the problems of the liability regime is that it does not provide a detailed implementation scheme, e.g. an exact definition of sub-patentable innovations, what constitutes infringement, and registration procedures. Reichman does not provide concretely the definition of what makes sub-patentable innovations. Definitions such as small-scale (or sub-patentable) innovations that do not rise to the level of novel and non-obvious inventions or original and creative works of authorship and cumulative and sequential working out of shared or common technical trajectories are vague. There have been many debates about the issue of how an invention can be characterized as novel, and it is much more difficult to determine the level of non-obviousness, especially in the software industry. It is not specified what the lowest level of sub-patentable innovations which would qualify as the subject matter of the liability regime. This needs to be dis-

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<sup>187</sup> Louis Kaplow & Steven Shavell, *Property Rules Versus Liability Rules: An Economic Analysis*, 109 HARV. L. REV. 713, 716 (1996). A property right precludes third parties from appropriating the object of protection, whereas a liability rule regulates on certain conditions. For example, if one has possession of something such as a car or a house under an exclusive property right, another person ordinarily cannot take it without permission, but under a liability rule, others may engage in acts that create risks of harm and thus constitute probabilistic invasions of property interests, while obligating them to pay damages for harm under specified circumstances.

<sup>188</sup> J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51 (1997), available at <http://eon.law.harvard.edu/h2o/property/alternatives/reichman.html> (last visited July 21, 2001).

<sup>189</sup> Reichman, *supra* note 7, at 29.

<sup>190</sup> *Id.* at 51.

cussed because not all kinds of selections, adding, rearrangements, modifications and adjustments should be protected. There should be minimum requirements to be regarded as sub-patentable.<sup>191</sup> These aspects are closely related to infringement. For examples, simple change of components, which are equivalents, or simple modifications of known elements without any resulting effects, should not be regarded as the subject matter of liability protection. The problems with registration have been discussed above.

For the compensatory liability regime to be employed as an actual protection system, these problems need to be addressed.

### C. *Utility Models*

The main features of the utility model, compared with a patent, are a lower level of inventiveness than that required for a patent, the absence of prior examination, and a short protection period. These features appear to reflect the characteristics of software innovations. However, the main problem with the utility model is the fact that its subject matter is mainly devices relating to the shape, or construction of articles, or a combination of such things. Methods of construction or articles not having a certain shape are excluded from utility model protection. Thus, protecting software by the utility model system appears to be inappropriate, since software has no shape and is an execution of complex logic. However, in the sense that programs are machines,<sup>192</sup> and that writing programs is an industrial compilation of sub-components, which is similar to the design of physical machines, software can be regarded as a device having *virtual* shape.

Another important problem of the utility model is that it is a proprietary right. The exclusive property regimes uniformly impose on the process of follow-on innovation unacceptably high social costs.<sup>193</sup> An exclusive property regime fails to solve the problem of follow-on applications of sub-patentable know-how to marketed products. Any system that protects sub-patentable applications of technical know-how by means of a property right will tend to reward individual innovators as if they had produced major innovations.<sup>194</sup> That is, by rewarding individuals with strong exclusive property rights for routine applications of the community's technical know-how, the system tends

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<sup>191</sup> PATENT LAWS ART. 29 (S. Korea) (when an invention could easily have been made prior to the filing of the patent application by a person having ordinary skill in the art to which the invention pertains, a patent shall not be granted for such an invention)[Requirements for patents].

<sup>192</sup> See generally, *A Manifesto*, *supra* note 6.

<sup>193</sup> Reichman, *supra* note 7, at 28.

<sup>194</sup> *Id.* at 37.

to make that shared know-how artificially scarce. As the tiny bundles of small-scale innovation covered by strong IPRs and strong contractual rights increase, the community's shared know-how is divided into ever-smaller pieces, which are withdrawn from the public domain.<sup>195</sup> This process produces a tangled web of property rights and constitutes a barrier to entry and a disincentive to further small-scale innovation. The need to bargain around an exclusive property right complicates routine business transactions and adds new risks of infringement litigation to the innate risks of predicting market success. In sum, property-based rules impede follow-on developments, ignore the significant contributions of the public domain, and increase transaction costs.

In the computer software industry, the patent (and copyright) system is creating a *patent thicket*.<sup>196</sup> The vast number of patents currently being issued creates a real danger that a single product or process will infringe many patents.<sup>197</sup> Moreover, many patents cover products or processes already being widely used when the patents are issued, and they make it harder for the companies actually manufacturing products to invent around the patents. Furthermore, a patent holder can seek injunctive relief, i.e. can threaten to shut down the operations of the infringing company. There have been many concerns about a patent thicket being created by e-commerce and BMPs. In this state of affairs, the introduction of the utility model that is also a proprietary right would mean establishing *utility model thicket*<sup>198</sup> on the top of patent thicket. It would make matters worse.

As for the issue of the lower level of inventiveness in the utility model, it is almost the same as that of non-obviousness in sub-patentable innovations discussed above.

#### D. Direct Protection of Innovation

Direct protection of innovation aims at protecting innovations rather than inventions. Innovation patents or warrants would be given

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<sup>195</sup> *Id.* at 38.

<sup>196</sup> Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard Setting* (2001), available at <http://haas.berkeley.edu/~shapiro/thicket.pdf> ("patent thicket" means an overlapping set of patent rights requiring that those seeking to commercialize new technology obtain licenses from multiple patentees. Cross-licensing and patent pools are two natural and effective methods used by market participants to cut through the patent thicket).

<sup>197</sup> Almost all authors of software will involuntarily infringe a software patent when they publish their software.

<sup>198</sup> Shapiro, *supra* note 195, at 2 (the term "utility model thicket" is devised by the author in order to mean the *thicket* created by a great number of utility models).

to the initial act of commercializing computer programs.<sup>199</sup> Direct protection by an innovation patent is similar to copyright, which protects the work *itself*.<sup>200</sup>

The direct protection effectively protects incremental innovations, which become cumulatively more important in the modern software industry, by giving up the "inventive step" criterion.<sup>201</sup> The innovation patent can protect many incremental innovations such as transposition, application, identification, formulation, selection, simplification, combination and aggregation of software components. Modifications of software components, which already exist, can obtain an innovation patent if it is not a technical equivalent of an option claim of the initial innovation patent.<sup>202</sup> In other words, in the case of a second innovator who has brought an incremental change to a protected product, protection will be granted for the incremental change (with the requirement that the innovation cannot be put into practical effect without infringing the first innovator's right). The use of the incremental improvement will thus depend on agreement between the two parties. The relationship between the first comer and second comers is similar to that of the liability regime.<sup>203</sup> Thus, the direct protection system solves the problem of how to enable companies to appropriate the fruits of their investment in sequential innovation without impeding follow-on innovation.<sup>204</sup>

In the direct protection system, fear of litigation greatly diminishes compared with the classical patent system. A competitor can follow by innovating around a copy claim by changing the product in the ways that are not technically equivalent. Alternatively, he can seek a license under one of the option claims. A license to use the alternatives covered by option claims must be granted. Moreover, in the warrant system, any product which was on the market at the time of the application for a warrant cannot be affected, and any product which is the subject of an innovation warrant cannot be held to infringe any other warrant.

The elimination of the warrant-holders' burden of protecting their rights makes the differences in their size and their capacity to pursue litigation irrelevant. Due to the monopoly conferred by its in-

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<sup>199</sup> Direct protection of innovation by warrants is achieved by making the subject matter an investment that turns an idea into concrete reality.

<sup>200</sup> Kingston, *supra* note 8, at 39 (copyright does not protect any idea or concept for the work which an author might have in mind).

<sup>201</sup> Kronz, *supra* note 8, at 267, 271.

<sup>202</sup> *Id.* at 271.

<sup>203</sup> See *supra* Part II.B.

<sup>204</sup> Reichman, *supra* note 7, at 23.

novation patent or warrant, SMEs are the equal of the large firms as far as a particular innovation is concerned. This is very desirable because SMEs are great source of innovations,<sup>205</sup> and because this makes it easy to establish a new company and makes large companies more innovative. Moreover, the innovation patent and the innovation warrant are incontestable unless obtained by fraud.<sup>206</sup> Incontestability and freedom from litigation (in the innovation warrant) can be a good base for investment.

One of the main problems of the Kronz system exists in the examination of the novelty criterion. A document carries weight in the examination to the extent that it provides evidence of prior reduction to practice of the concept, together with its actual use in public.<sup>207</sup> It would be very difficult for an examiner to find a document with the evidence of prior reduction to practice and actual use in public, since there is no established prior art of this kind. Establishing prior art with such evidence would be a difficult job. Without an established prior art, accurate examination of the innovation patent applications would be unimaginable. There is a similar problem in the innovation warrant system. In the innovation warrant, novelty depends on the purchasability of the subject matter of a warrant application in the ordinary course of trade. The purchasability of software differs depending on time. Software that was purchasable may become otherwise as time goes by. Finding a prior art with the evidence of the purchasability and establishing a prior art with such evidence for the examination are also a difficult job, especially when combined with the typical problems with the prior art in the software industry.

In determining whether or not an object belongs within the scope of the protection of an innovation warrant, it is necessary to decide whether the object is a "commercial equivalent." However, as time goes by, an object, which constituted infringement before, may become other than a "commercial equivalent", according to the changing market, and vice versa. Moreover, when it comes to computer programs, the scope of "commercial equivalence" becomes more broad and vague. It is difficult to determine whether a computer program belongs within the scope of "commercial equivalent" of another computer program to which a warrant is granted, because it includes consideration of the time and the changing market, which the software product belongs to. Furthermore, considering the realities of the development of software, the criterion of "commercial equivalent" is so

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<sup>205</sup> See *supra* Part II.C.3.

<sup>206</sup> However, due to the incontestability, the problem of bad innovation patents exists when innovation patents were granted to already known innovations.

<sup>207</sup> Kingston, *supra* note 8, at 48.



broad as to include almost all incremental improvements, which have been made on the top of existing software products. In this respect, there would be many disputes.

The two proposals by Kronz and Kingston, however, are so well equipped with details of their implementation that they may be regarded as being capable of supplementing or replacing the classical patent system in this field. Moreover, they are so similar to the classical patent system that existing patent offices could take over the job of the direct protection system without establishing an Innovation Office separately. The patent examiners would be able to deal with the innovation applications with some training. The public as well would not have much difficulty in applying for an innovation patent or warrant, because they are already accustomed to the classical patent system. These features enhance the feasibility of the two proposals.

### E. Self-help Systems

Self-help systems will reduce the incidence of copyright violations. They are one of the crucial success factors in e-commerce. The systems can facilitate implementation of many of the ideas underlying pro-competitive and fair use ideas embedded in intellectual property law.<sup>208</sup> Self-help systems can harness the features of digital copies that are generally identical with one another. The technology of self-help systems lowers transactions costs and thereby reduces undesirable social behavior such as free riding appropriation. As transaction costs go down, it is easier for people to do the right thing. Self-help systems are not just for software providers, but also for the users' benefit.

The majority of SMEs regard technical systems of protection as well as copyright and licensing as the most useful methods of protection.<sup>209</sup> The survey<sup>210</sup> on how SMEs rank the importance of methods of IP protection reveals that 24% of SMEs regarded technical systems of protection as the most important, and 52% of those interviewed considered market niche and technical systems of protection as important methods of protection.<sup>211</sup> This data suggests that self-help systems are an appropriate protection form for software.

Self-help systems, however, are vulnerable to attack. Development of software technologies would make it possible to detect digital watermarks and to wash them out. In spite of their advantages, de-

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<sup>208</sup> Dam, *supra* note 157, at 110.

<sup>209</sup> Adams and Tang, *supra* note 117, at viii, 58.

<sup>210</sup> The research sponsored by the UK Economic and Social Research Council, under the £1.2 million program *Intellectual Property Initiative*.

<sup>211</sup> Adams and Tang, *supra* note 117, at 19 (27% of SMEs ranked licensing as the most important means of protection; and 21%, copyright).

pending on self-help systems completely may result in market failure, especially when software developers are SMEs which have a limited ability to use the technology of self-help systems, and when large companies, which have enough resources to make the self-help technology useless, are trying to free ride the computer programs developed by the SMEs. Thus, the self-help systems would need a supplementary form of protection.

#### IV CONCLUSION AND SUGGESTION

##### A. Conclusion

In conclusion, while the market-oriented regime provides a basic framework for constructing a new form of legal protection for software, the regime does not have enough details for a model statute.<sup>212</sup> Reichman's compensatory liability regime solves the critical issue of the relationship between the first comer and second comers in sequential innovation, i.e. encouraging innovation without impeding follow-on innovation. The liability regime, however, does not provide detailed implementation proposals. Thus, both the market-oriented regime and the liability regime are not feasible in the near future. The utility model makes the patent thicket more complex by establishing *utility model thicket* which impedes follow-on innovations. Thus, the utility model system does not solve the most serious problem of the existing legal regimes. The direct protection of innovation not only solves the most serious problems, but also satisfies more goals and principles for a market-oriented approach than any other alternative. For example, the system effectively protects incremental innovations by solving the most critical problems of the classical patent system, which discourages software innovation by impeding follow-on innovation. The system can be established on existing legal foundations. The system has many other advantages such as reduced fear of litigation, elimination of the warrant-holder's burden of protecting his right, incontestability, feasibility (due to a detailed scheme of implementation) and familiarity (of examiners and the public).

Consideration of these advantages leads us to choose direct protection of innovation as the most appropriate form of protection for software. However, as discussed above, in establishing a new legal regime for software protection, the direct protection system needs more development concerning the novelty criterion, the issue of prior art, the scope of protection (e.g. "technical equivalence" or "commercial

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<sup>212</sup> *A Manifesto*, *supra* note 6, at 2310-2316.

equivalence”) and so on. Complementary aspects of the two proposals by Kronz and Kingston should also be considered and the better elements of each adopted. For example, the criterion of “technical equivalence” appears to be more recommendable for the protection of software than that of “commercial equivalence”. In terms of the novelty criterion, the criterion of initial commercialization in the innovation patent, which is similar to copyright system, appears to be more appropriate for the software protection than that of purchasability in the innovation warrant. Elimination of the warrant-holder’s burden in the innovation warrant is good for SMEs to be treated equally to large firms with regard to a particular innovation.

### *B. Suggestions for the Introduction of the Direct Protection*

Computer programs freely move around the world through the Internet. If innovative software is protected in only one national jurisdiction, that would not help the innovator substantially because the software would be copied in the other jurisdictions without any restriction. Development of the Internet<sup>213</sup> and information technology leads to consider worldwide protection for software, i.e. unitary innovation patents based on the World Innovation Patent system.<sup>214</sup>

In introducing the Direct Protection of Innovation at international level, there could be two options: one is to establish a world unified Innovation Office in which a unitary innovation patent is granted; the other is to establish national innovation patent offices in which a unitary innovation patent is filed, published and examined based on the World Innovation Patent system. Both of the two options require a *Software Innovation Convention*, which is based on the concepts of the direct protection of innovation, between member countries. A main problem of the latter choice is difficulties in maintaining consistency in the examination in every jurisdiction. It would be extremely difficult to keep an equal level of examination quality and application of criteria throughout all member countries. Close links between national patent offices would be essential to exchange the information such as prior art, applications, publications or examination results. In order to accomplish a satisfactory cooperation, information networks between national patent offices would be necessary.

If a unified Innovation Office is established, consistency and quality in the examination could be secured, because standardized educa-

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<sup>213</sup> The Internet is often described as the biggest copy machine.

<sup>214</sup> Gerald J. Mossinghoff, *World Patent System Circa 20XX, A.D.*, (edited transcript of remarks delivered to the Yale Law and Technology Society) 1 YALE SYMP. L. & TECH. 3 (1999).

tion for examiners, establishment of relevant prior art, uniform examination guidelines and so on could easily be accomplished. Uniform examination is very important in the software innovation patents, because if an innovation patent were granted to a computer program, it would be valid in the all member countries. Thus, the author suggests the following:

1. A world unified Innovation Office is established at the WIPO<sup>215</sup> where filings may be made to grant protection in every country based on a Software Innovation Convention. According to the Convention, a member may file a single application to the Innovation Office and receive protection in each country.<sup>216</sup>
2. The Innovation Office deals with main administration such as examination, publication and issuance of innovation patents.
3. In order to cooperate with the central Office, local innovation offices are established at each member country's patent office. The local innovation offices would connect between domestic applicants and the central Office. The local offices would receive applications and send them to the central Office. They would also satisfy individual needs of applicants.
4. An application can be made by filing either in the Innovation Office directly or in any member country's innovation office, which would transfer the application to the central Innovation Office.
5. A worldwide search is performed at the Innovation Office.
6. The definition of novelty extends to "not available in the ordinary course of trade within the Community's boundary" or "anywhere in the world" when the Community comprises worldwide countries as the Patent Cooperation Treaty (PCT) does.<sup>217</sup>
7. Innovation patents are granted when computer programs are initially commercialized within the Community's boundary (*First-to-Commercialize Priority System*).<sup>218</sup> A useful legal effect, however, is attached to the date of filing in the innovation office.<sup>219</sup> When the date of commercialization is not clear, the filing date is adopted.
8. The scope of protection is determined by "technical equivalence".

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<sup>215</sup> WIPO is a UN agency headquartered in Geneva, established in 1967. As of July 1998, it had 171 members. *Joint WTO-WIPO Press Release*, July 21, 1998.

<sup>216</sup> See e.g., Mark Aaron Paley, *A Model Software*, 12 SANTA CLARA COMPUTER & HIGH TECH. L.J. 301 (1996).

<sup>217</sup> Kingston, *supra* note 8, at 63.

<sup>218</sup> The term, "First-to-Commercialize Priority System", is devised by the author in line with the term, first-to-file priority system.

<sup>219</sup> Kronz, *supra* note 8, at 263.

9. The enforcement of the innovation patents is publicly rendered by the cooperation between the central Innovation Office and the local innovation offices.
10. Once granted, the innovation patent is incontestable unless acquired by fraud.
11. For the Innovation Office to work effectively, it is necessary to establish an inventory of computer programs that are used, or have been publicly used in the Community.<sup>220</sup> The digital prior art database would be accessible via the Internet from the local innovation offices or anywhere in the world.
12. Examiners of the Innovation Office are composed of experts from the member countries.
13. The Innovation Office functions as the software library and licensing agency. Anyone interested in a program should be able to license the program with licensing fee, which should be transferred to the program owner.<sup>221</sup> The program owner should pay a certain amount of administration fee to the Innovation Office.
14. English is used as the official language. This reduces administration costs and possibility of misunderstanding between applicants and the Innovation Office.<sup>222</sup>
15. A world innovation patent court or an arbitration tribunal should be established at the WIPO.
16. At the outset, groups of countries may form a Community, a single *domestic* area for innovation patents.<sup>223</sup> Afterwards, the Community may include more countries widely. Leadership toward the world system would be coming from three jurisdictions, i.e. Europe, the US and Japan, by establishing a trilateral innovation patent system covering the three jurisdictions. Europe, the US and Japan would need to negotiate a convention, e.g. *Software Innovation Convention*, to set up the trilateral system. Other countries should be permitted to join this system.

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<sup>220</sup> *Id.* at 270.

<sup>221</sup> Jozef Halberszadt, *Remarks on the Patentability of Computer Software – History, Status, Developments*, available at <http://swpat.ffii.org/penmi/linuxtag-2001/jh/indexen.html> (last visited December 15, 2003).

<sup>222</sup> Gerald J. Mossinghoff, *World Patent System Circa 20XX, A.D.*, 38 IDEA 529, 552 (1998) (more than 75% of all technical information is published in English first, and almost 90% of all technical information on the Internet is in English).

<sup>223</sup> See generally Kingston, *supra* note 8.